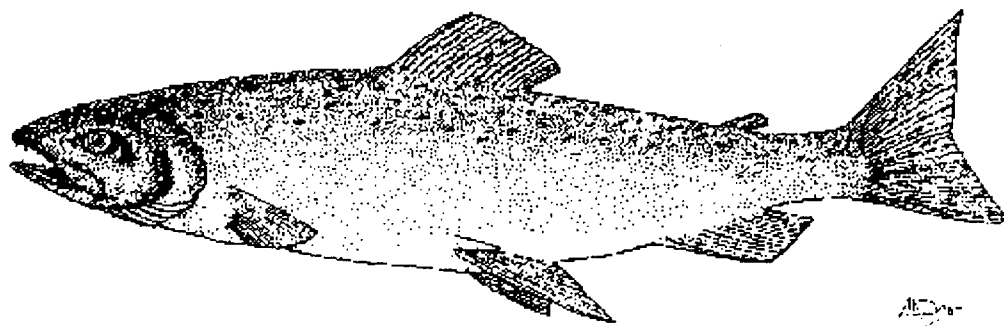


**NORTON SOUND AND KOTZEBUE SOUND MANAGEMENT AREA  
SALMON CATCH AND ESCAPEMENT REPORT, 1996**



By

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## ABSTRACT

The 1996 commercial and subsistence harvest and escapement information for the five species of Pacific salmon *Oncorhynchus* found in the Norton Sound and Port Clarence Management Area and the one species of *Oncorhynchus* found in the Kotzebue Sound Management Area in significant abundance are presented by age, sex, and length. The 1996 Norton Sound District commercial harvest totaled 571,068 salmon and was composed of 4,984 chinook (*O. tshawytscha*), 10,609 chum (*O. keta*), 1 sockeye (*O. nerka*), 487,441 pink (*O. gorbuscha*) and 68,033 coho (*O. kisutch*) salmon. The commercial harvest was 26% below the 1991-95 average for chinook salmon, 81% below for chum salmon and 6% below for coho salmon. Although the pink salmon harvest was the second largest on record, it fell far short of expectations, due to floods on the spawning grounds in 1994. Sockeye salmon are only present in small numbers in this area. Aerial escapement surveys for chum salmon in northern Norton Sound were affected by survey timing and conditions, but generally indicated escapements ranged from below to well above escapement goals. Escapements for chinook, chum and coho salmon in southern Norton Sound were well above average. Six counting tower projects and one weir project were operational in Norton Sound in 1996 to provide more complete information on salmon spawning escapements, and those data are reported here. In the Kotzebue District, the commercial harvest totaled 79,910 chum salmon. An incidental catch of 3 chinook salmon and 188 Dolly Varden was also reported. There was a reported commercial harvest of 308 sheefish from the Kobuk Lake winter fishery. Subsistence catches of these species plus whitefish, sheefish, northern pike and burbot also occur in the Kotzebue District. The chum salmon commercial harvest in 1996 was well below the 1979-95 average of 282,900 fish. Aerial escapement surveys indicated the chum salmon escapement was at or near record levels in most index areas. Record catch rates and high catches at the Kobuk River test fishery also indicated escapement was well above average.

KEY WORDS: Norton Sound, Kotzebue Sound, harvest, escapement, *Oncorhynchus tshawytscha*, *O. nerka*, *O. keta*, *O. kisutch*, *O. gorbuscha*, age-sex-length composition, fishery synopsis



## INTRODUCTION

The Norton Sound, Port Clarence, and Kotzebue Sound commercial salmon management districts include all waters of Alaska from Canal Point Light, south of Stebbins, to Point Hope, north of Kotzebue. The Port Clarence District has been closed to commercial salmon fishing since 1966. The Norton Sound District includes all waters of Alaska from Canal Point Light north to Cape Douglas (Figure 1) and consists of six subdistricts: 1 (Nome), 2 (Golovin), 3 (Moses Point), 4 (Norton Bay), 5 (Shaktoolik), and 6 (Unalakleet). These subdistricts are intended to concentrate commercial harvests on stocks which spawn in the watersheds flowing into the respective subdistricts. The Kotzebue Sound District includes all waters of Alaska from Point Hope to Cape Prince of Wales, but commercial salmon fishing is restricted to Subdistricts 1 and 2, consisting of ocean waters north of the Baldwin Peninsula (Figures 2, 3). Subdistrict 2, Noatak River mouth, normally remains closed unless the chum salmon return is substantially above average.

Five species of Pacific salmon are found in the Norton Sound and Kotzebue Sound areas. In descending order of economic importance in 1996, they are coho salmon (*Oncorhynchus kisutch*), pink salmon (*O. gorbuscha*), chinook salmon (*O. tshawytscha*), chum salmon (*O. keta*) and sockeye salmon (*O. nerka*). In Norton Sound the returns of pink salmon are the largest of the five species, followed by chum, coho, chinook, and sockeye salmon. In some years the coho salmon return is thought to be greater than the chum salmon return. In the Kotzebue Sound District, chum salmon are the predominant species.

Knowledge of the magnitude, distribution, timing, and age-sex-length composition of both the harvest and escapement by stock is fundamental to managing salmon fisheries and achieving full production. Age, sex, and length composition of samples from selected salmon harvests and escapements in the Norton Sound and Kotzebue Sound areas have been reported since 1962 and are presented in this report for 1996.

Fishery statistics for the Norton Sound and Kotzebue Sound areas are available from several additional sources. Commercial and subsistence harvest and spawning escapement data from 1961 to 1996 have been summarized in the Norton Sound - Port Clarence - Kotzebue Sound Annual Management Report (Lean et al. *In Press*). In addition, the results from escapement assessment projects are analyzed and reported annually. For the 1996 season these included test fishery projects on the Unalakleet River (Rob, 1997h) and the Kobuk River (Lingnau, 1996b), counting tower projects on the Kwiniuk River (Rob, 1997a), Shaktoolik River (Rob, 1997b), Niukluk River (Rob, 1997d), North River (Rob, 1997e), Eldorado River (Rob, 1997f) and Snake River (1997g), and a weir on the Nome River (Rob, 1997c).

Age, sex, and length data for Norton Sound and Kotzebue Sound salmon from 1962 to 1982 are summarized in an unpublished report series entitled ADF&G Arctic-Yukon-Kuskokwim Region Age-Sex-Size Composition of Salmon. Beginning with the 1983 season these data have been published in an annual report (Lean et al. 1984; Bigler and Lean 1986; Hamner 1987, 1989a, 1989b; Buklis 1991a, 1991b; Lingnau 1992, 1994a, 1994b; Blaney and Lingnau 1995; Lingnau 1995, 1996a).

This report presents catch, escapement and age-sex-length data for the Norton Sound and Kotzebue Sound management areas for 1996.

## METHODS

### *Harvest and Escapement*

Commercial catch data presented in this report were compiled from harvest receipts, i.e., *fish tickets*, which document each sale by a licensed fisherman. These data were summarized by microcomputer in the Nome and Kotzebue offices during the fishing season.

Funds were dedicated in 1994 to conduct in-depth subsistence harvest surveys for most villages in the Kotzebue, Port Clarence the Norton Sound Districts. These surveys continued in 1996 as well. Villages surveyed in the Norton Sound and Port Clarence Areas were Brevig Mission, Elim, Golovin, Koyuk, Shaktoolik, St. Michael, Stebbins, Teller, Unalakleet, and White Mountain. In the Kotzebue Area, the villages of Ambler, Kiana, Kobuk, Noatak, Noorvik and Shungnak were surveyed. In the City of Kotzebue, mailers to be filled out and returned were sent to households to assess harvests of salmon. A subsistence permit is required to subsistence fish in the Nome Subdistrict, and catch limits are set by permit for each river and species. The members of each household were asked how many salmon were caught for subsistence use. During these surveys it was assumed that fishermen could accurately recall their harvests, which may have occurred over a period of several months.

The Division of Subsistence has conducted other in-depth subsistence harvest interviews in the region. These studies include the city of Kotzebue in 1986 (Georgette and Loon 1993), the village of Unalakleet in 1989-90 (Magdanz and Seitz 1993), Elim in 1992 and 1993 (Jim Magdanz, ADF&G, Nome, personal communication), the Nome Subdistrict in 1975-1991 (Magdanz 1992), and Brevig Mission, Golovin and Shishmaref in 1989 (Conger and Magdanz 1990).

Aerial surveys historically have been the primary method for monitoring salmon escapements to the Norton Sound and Kotzebue Sound drainages although a number of escapement projects are now operating in Norton Sound. Aerial surveys do not provide a total estimate of salmon spawning abundance. Aerial survey escapement counts are, at best, an index of relative abundance for the surveyed streams. To compare aerial surveys across years, surveys are attempted in approximately the same time frame each year for the same index areas. Weather conditions, pilots and surveyors are also variables in aerial survey counts. Comparing commercial catch statistics to previous years provides an index of run strength and timing. Test fishing provides an index of escapement and species composition for turbid or large drainages that are difficult to monitor visually. Test fishery catch and catch per unit effort (CPUE) statistics are used as an index of relative abundance. Counting towers, weirs and sonar projects provide a better estimate of escapement. The following projects conducted during the 1996 season provided data on salmon escapement abundance and timing in Norton Sound: Nome River weir and Snake and Eldorado River towers in Subdistrict 1, Niukluk River tower in Subdistrict 2, Kwiniuk River tower in Subdistrict 3, Shaktoolik River tower in Subdistrict 5 and North River tower in Subdistrict 6 (Appendix C). A test fishing project on the Unalakleet River in the Unalakleet Subdistrict was used to index escapement into that drainage. Due to a lack of technical resources, the sonar escapement project on the Noatak River did not operate in 1996. For the fourth year, a test fishing project was conducted on the Kobuk River near the village of Kiana to index salmon escapements into the Kobuk River system.

### *Age, Sex, and Length Data Collection*

Age was determined from scales removed from the left side of the fish in an area above the lateral line crossed by a diagonal from the posterior insertion of the dorsal fin to the anterior insertion of the anal fin. Scales were mounted on gum cards and impressions made in cellulose acetate. Ages were reported in European notation (the first digit refers to the freshwater age and does not include the year spent in the gravel; the second digit refers to the ocean age). Sex was determined by examining external characteristics, such as; snout, vent, body symmetry, extruded eggs, ovipositor or milt of live fish. The sex of dead fish was determined by examining the gonads, if necessary. Fish length to the nearest millimeter was measured from mid-eye to fork-of-tail.

In some cases sex and length data but no ageable scales were obtained from fish, and in other cases ageable scales were collected without corresponding sex or length data. Therefore, numbers of fish in a length-by-age summary table may differ from numbers of fish in a sex-by-age summary table for a given fishery or escapement sample.

### *Sample Size*

Minimum sample size goals were established for temporal strata based upon simultaneous interval estimation of age class composition. Two methods of determining sample size goals, based on different methods of constructing simultaneous confidence intervals, have been employed. For most purposes, sample size goals were developed using the method of Thompson (1987). Sample size goals were established such that 95% simultaneous confidence intervals would be of width 0.2. This objective is satisfied with a sample size of 128 scales per strata, although the goal was increased to account for the expected number of unreadable scales in any particular instance. In the Kotzebue commercial fishery, where age composition is an important index of run strength, a sample size goal was developed using more stringent standards based on the method of Bromaghin (1993). The ages of chum salmon were categorized into three age classes; age 4, age 5, and age 3 or age 6. The sample size goal was chosen such that the width of 95% simultaneous confidence intervals (Goodman 1965) would not exceed 0.15. A sample of 249 fish per stratum satisfied this objective. The sample size goal was increased to 280 fish per stratum to account for the expected number of unreadable scales.

## **RESULTS**

Commercial fishery samples were collected from chum salmon in Norton Sound Subdistrict 5, and chinook, chum and coho salmon in Subdistrict 6. Sufficient commercial fishery samples were collected to estimate age and sex composition of the harvest for chum salmon in the Kotzebue District. Chinook, chum, and coho salmon were sampled from the Unalakleet River set gillnet test fishing catch. Because of the selectivity of the 5-7/8 in (149 mm) stretched-mesh gillnets used on the test net project, the samples are not an unbiased estimate of spawning escapement age, sex, and size composition. Chum salmon escapement samples were collected from tower projects on the Niukluk and Kwiniuk Rivers using beach seines. Niukluk River coho samples were collected from both sport fish catches and escapement carcass samples. In the Kotzebue District, chum salmon from drift test fishing catches were sampled on both the Kobuk and Noatak Rivers. Age-sex-length data were

collected from chum salmon carcasses from the Salmon River, Squirrel River and Selby Slough vicinity in the Kobuk River drainage. Comparisons of age, sex, and size composition between samples in this report are non-statistical comparisons. Temporal distribution of some samples may be of concern. Some samples are marginally adequate and may not have been collected proportionally to the catch or abundance.

## *Norton Sound*

### **Commercial and Subsistence Harvest**

The 1996 Norton Sound commercial harvest totaled 571,068 salmon and was composed of 4,984 chinook, 10,609 chum, 1 sockeye, 487,441 pink, and 68,033 coho salmon (Table 1; Appendix A). Subdistrict 5 accounted for 57% of the total commercial salmon harvest (in numbers of fish) in 1996, followed by Subdistrict 6 (20%).

Coho salmon accounted for 48% of the total fishery value followed by pink salmon (35%), chinook salmon (15%) and chum salmon (2%). Two primary salmon buyers operated in Norton Sound during the 1996 season. One buyer purchased fish during the chinook and coho seasons while the second buyer was mostly interested in pink salmon. Chinook and coho salmon were delivered to Unalakleet via tender and aircraft for processing. The salmon were headed and gutted, then shipped air freight to markets. The second buyer purchased pink salmon and tendered fish throughout Norton Sound to their floating processor vessel located along the eastern coast. Pink salmon were processed with pollock filet equipment. Product was then packaged, frozen and held on board. A few fishermen sold their catch locally and to wholesale distributors, as permitted under catcher/seller regulations. The average price paid was \$0.54 per pound for chinook, \$0.28/lb for coho, \$0.10/lb for pink and \$0.08/lb for chum salmon. The total ex-vessel value of the raw fish was \$340,347, 30% below the previous 5 year (1991-1995) average.

Although many of the residents of Norton Sound are dependent to some extent on the fish and game resources of the area, subsistence salmon catches generally were not monitored from 1983 through 1993, except in the Nome Subdistrict. Prior to 1983 the Department conducted annual household surveys in many of the villages. For the last 5 years in which these surveys were conducted, 1978-1982, the average annual subsistence catch in the Norton Sound area was 73,000 salmon for all species combined. Because not all households were contacted, this should be considered a minimum estimate.

In the Nome Subdistrict (Figure 2), subsistence permits require that fishermen document their harvest by species. There were 117 subsistence permits issued in 1996. A total of 63 permits were returned of which 44 reported having fished. The reported permit harvest of 6,184 salmon was composed of 9 chinook, 165 sockeye, 2,125 chum, 3,060 pink, and 825 coho salmon (Table 2). Funds were dedicated to do comprehensive subsistence surveys in Norton Sound and Kotzebue Sound in 1994, 1995 and 1996. The villages surveyed in 1996 were listed in the methods section.

Results of the survey for 1996 indicate an estimated 129,286 salmon were harvested for subsistence purposes in Norton Sound (Table 3). This estimate includes the permit fishery in Northern Norton Sound. The largest percent of the harvest was pink salmon (47%), followed by chum salmon (26%), coho salmon (20%), chinook salmon (5%), and a small amount of sockeye salmon (>1%). The largest quantity of salmon was taken from the village of Unalakleet which also had the largest number of households that fished. The average number of salmon (species combined) taken by each household in Norton Sound was 154. The highest average number of salmon taken per household was in Shaktoolik (328) and the lowest was in Nome (98). Port Clarence villages harvested an estimated

10,684 salmon with an average number of salmon per household of 81 where the largest percent of the catch was again chum salmon followed by sockeye, pink, coho and chinook salmon.

### **Escapement Abundance**

Subdistricts 5 and 6 support the largest chinook salmon returns in Norton Sound. Escapement surveys, commercial, subsistence and test net catches indicated above average numbers of chinook salmon in Subdistrict 5 and 6.

Aerial escapement surveys for chum salmon were affected by survey timing and conditions, but generally indicated that escapements ranged from below to well above escapement goals (Table 4). In Subdistrict 1, results were mixed. Some drainages (Eldorado and Flambeau) were well above their escapement goals while other rivers were below or near the escapement goals. Escapements into the Niukluk River were thought to be adequate.

The Kwiniuk River, in Subdistrict 3, had 27,256 chum salmon pass the tower site, 1/3 above the goal of 19,500. Chum salmon escapements into Subdistricts 5 and 6 indicate that escapement objectives were achieved there as well. The test fish project in Unalakleet had the highest cumulative catch rate since 1981.

Overall, coho escapements appeared to be well above average. Escapements into northern Norton Sound were just above average while coho salmon escapements into southern Norton Sound were well above average.

Pink salmon returning to Norton Sound have exhibited an odd/even year cycle in recent years. The even year normally has a much larger return than the odd year. In 1996, the return throughout Norton Sound appeared to be on the order of one-half of the 1994 record run. This was thought to be the result wide spread flooding, impacting spawning grounds after the peak of the season.

There have been several new cooperative escapement projects implemented in the past couple of years. Those projects are listed under METHODS, *Harvests and Escapements*. The only project with an escapement goal is the Kwiniuk River tower. That escapement goal is for chum salmon only, as it is the species with the longest historical escapement information. Escapement counts for other species and projects are as follows (Appendix Tables C.1-C.7). The Kwiniuk River had tower counts of 907,894 pink salmon, 577 chinook salmon and 461 coho salmon. The Nome River weir enumerated 3,339 chum salmon, 95,681 pink salmon, 5 chinook salmon, 66 coho salmon and 18 Dolly Varden. Counts past the Niukluk River tower were 80,178 chum salmon, 1,154,765 pink salmon, 243 chinook salmon, 12,818 coho salmon and 3,935 Dolly Varden. Snake River tower counts were 2,772 chum salmon, 44,558 pink salmon, 5 chinook salmon and 1,638 coho salmon. The Eldorado River tower project counted 12,655 chum salmon, 46,095 pink salmon, 27 chinook salmon and 324 coho salmon. The North River tower, a tributary of the Unalakleet River, counted 9,789 chum salmon, 332,539 pink salmon, 1,197 chinook salmon and 1,229 coho salmon. The Shaktoolik River tower counted 44,840 chum salmon, 625,155 pink salmon, 1,886 chinook salmon, 1,585 coho salmon and (54) Dolly Varden. Projects were not funded to enumerate entire runs of some salmon species, therefore some species counts should be considered as conservative estimates.

## **Age, Sex, and Length Composition**

The chinook salmon commercial harvest sample in Subdistrict 6 was composed of 47% age-1.3, 40% age-1.4 with smaller amounts of age-1.1, age-1.2, age-2.3, age-1.5, and age-2.4 fish. The sample was 61% male and 39% female. A sample of 118 chinook salmon from the Unalakleet River test fishery was 78% age 1.3, 12% age 1.4, and smaller amounts of ages 1.1, 1.2 and 1.5, with 60% of the total being female. Mean lengths by age group for all samples collected ranged from 402 mm for age-1.1 males to 1,035 mm for age-1.5 males, both were from the Subdistrict 6 commercial fishery sample (Tables 5, 6).

Chum salmon age 0.3 and 0.4 from the Subdistrict 5 sample were nearly equal, (45% and 48%) with the rest composed of age-0.5 (7%). The female composition was 57% with males composing 43%. The Subdistrict 6 chum salmon sample age composition was mostly age 0.4 (57%), followed by age 0.3 (24%). Females were dominant with 76% of the sex composition. A sample of 503 chum salmon from the Unalakleet River test fishery was 52% age-0.4, 27% age-0.5, 20% age-0.3 with smaller amounts of age-0.2 and age-0.6. The sex composition consisted of 61% males and 39% females. The escapement sample from the Kwiniuk River had nearly equal proportions of age 0.3 and age 0.4 (46% and 49%), while age 0.4 dominated the Niukluk River escapement sample with 52%, followed by age-0.3 (34%), and age-0.5 (13%). Males were predominant in both tributaries with 61% males in the Kwiniuk River and 54% in the Niukluk River. Mean lengths by age group for all samples collected ranged from 535 mm for an age-0.2 female from the Niukluk River escapement to 643 mm for age-0.6 males from the Niukluk River and escapement Unalakleet River test fishery (Tables 7, 8, 9 and 10). Samples through time from the Unalakleet River test fishery are found in Appendix B.

Subdistrict 6 coho salmon samples were dominated by age-2.1 fish accounting for 92%, with 61% females. There were 174 coho salmon sampled from the Unalakleet River test fishery and the age composition was similar to the Subdistrict 6 catch with 87% age-2.1 salmon. A sample of sport fish caught coho salmon and escapement carcass samples from the Niukluk River were nearly identical with 89% and 87% age-2.1 salmon. Males accounted for the largest portions in all of the test fish and escapement samples. Mean lengths by age group for all samples collected ranged from 568 mm for age-1.1 females from the Niukluk River sport fish catch to 638 mm age-3.1 male from the Unalakleet River test fishery (Tables 11-14).

## ***Kotzebue Sound***

### **Commercial Harvest**

The commercial harvest in the Kotzebue District during 1996 consisted of 79,910 chum salmon, 3 chinook salmon, and 188 Dolly Varden (Table 15). This commercial chum harvest was substantially below the projected harvest of 250,000-350,000 salmon due to poor market conditions. It was also well below the 17 year (1979-1995) average of 283,000. There were 55 permits that fished this year. This is the lowest number of participants since 1969 (52). The low fishing effort is attributed to construction related employment opportunities available in the region and the lowest price for salmon since 1965.

The buyer purchased a total of 639,624 pounds of chum salmon (average weight 8.0) at \$.09 per pound, 51 pounds of chinook salmon (average weight 17.0) at an average of \$1.00 per pound, and 1,153 pounds of Dolly Varden (average weight 6.1) at an average of \$.25 per

pound. The buyer began using an average weight for chum salmon during the second opening of 8 pounds, the average from the first opening, to reduce labor costs that would cut into the already marginal profits as allowed by Alaska Statute 16.10.270 (a). The total ex-vessel value was \$56,273 to Kotzebue area fishermen with an average of \$1,023 for each participating permit holder. The lone buyer packed the fish in ice and flew them out in the round to Anchorage for processing.

Dolly Varden (locally called trout) typically migrate along the northern shore of Kotzebue Sound. Because of reduced hours this year, fishermen concentrated their effort near town, away from that normal migratory route. The incidental catch was significantly reduced, only 188 Dolly Varden were sold, even though the average price was \$.25 per pound, nearly 3 times the price paid for chum salmon. The incidental Dolly Varden harvest has been as high as 7,700 in previous years but averages around 2,000.

Limited commercial harvest of miscellaneous finfish has been allowed since statehood, normally under the auspices of a permit which delineates harvest levels, open areas, legal gear, etc. There was no reported commercial harvest of whitefish, pike, or burbot during the 1996 commercial season. Sheefish are caught and sold primarily between mid-November and late March. There were eight permit holders, of which four were registered with the Fish and Game office. Two of those reported a harvest of 308 fish weighing 3,002 pounds (9.7 lb. average) with a value of \$1,309.

### **Sikusuilag Springs Hatchery**

The total predicted return of hatchery chum salmon was 90,000. Sixty-nine percent of the commercial catch was sampled with a total of 17 adipose clipped chum salmon found. From the 17 heads sent in, only 5 were found with tags in them. Three of the tags were from the 1990 brood year and two were from 1991. Using the confirmed tag data, the estimated contribution of hatchery chum salmon to the commercial catch was 495. This number does not include salmon from the brood year of 1992 as those fry were not tagged.

### **Subsistence Harvest**

Results from the Division of Subsistence survey indicate an estimated subsistence harvest of 100,235 salmon in the Kotzebue Sound area in 1996, with 98% of the harvest being chum salmon (Table 16). Smaller quantities of the other four species of salmon were reportedly harvested. The city of Kotzebue had the largest estimated harvest of 51,876 salmon, with the village of Kobuk taking the smallest quantity (2,011) salmon. These are also the locations with the largest and smallest human populations of the communities surveyed in the district. The village of Shungnak had the highest catch of salmon (species combined) per household (145) with Kiana the least (57). The village of Shishmaref was not surveyed this year.

There was an estimated subsistence harvest of 5,692 Dolly Varden from the village of Noatak. The subsistence harvest of sheefish from the upper Kobuk River villages was 6,953. The village of Noorvik reported a harvest of 3,362, more than twice that of the other villages. This is most likely because of their access to Kobuk Lake, an over-wintering location for sheefish.

## **Escapement Abundance**

Aerial survey conditions were typical this year. Dry weather early in the season allowed preliminary surveys to be flown on tributaries with early runs and clear late fall weather allowed peak surveys on tributaries with later spawning salmon. In general, escapement goals by aerial survey were exceeded on all tributaries by four times the goal levels with the exception of the Squirrel River. That tributary's escapement was twice the goal by aerial survey (Table 17).

The test fish index from the Kobuk River was the highest since 1993, the inception of the project. In 1993, a cumulative index of 494 was achieved. That same year, escapement goals by aerial survey overall were just met. In 1995, the cumulative test fish index was double that of 1993. That same year, escapement goals by aerial survey were double as well. In 1996, the cumulative test fish index was 5 times the 1993 index. Escapements by aerial survey were roughly 4 to 5 times greater than established goals. This indicates that results from the Kobuk River drift test fishing project are, for the years conducted to date, consistent with other methods of indexing run strength.

## **Age, Sex, and Length Composition**

Age groups 0.3 and 0.4 typically dominate the commercial chum salmon catch, with smaller percentages of age-0.2 and age-0.5 fish. The chum salmon commercial harvest for the season was composed of an estimated 1% age 0.2, 41% age 0.3, 49% age 0.4, 9% age 0.5, and 0.4% age 0.6. Lengths from the commercial catch ranged from 642 mm age-0.6 to 558 mm for age-0.2 females (Table 18). Sufficient samples were collected to stratify the season by fishing period (Appendix D).

Age composition from the Noatak and Kobuk River chum salmon drift gillnet test fishing samples were different, with age 0.3 and age 0.4 nearly equal in the Noatak sample (47% and 46%), while the Kobuk River samples were 58% age-0.4 fish and 32% age-0.3. Fifty-five percent of the samples from the Noatak River were female, whereas 55% of the samples from the Kobuk River test fishery were male. Mean lengths from the drift test fish samples ranged from 639 mm for age-0.6 males from the Kobuk River to 547 mm for age-0.2 females from the Noatak River (Table 19). Sufficient test fishing catch samples from the Noatak and Kobuk Rivers were collected to stratify the season by fishing period (Appendix D).

Spawning ground samples were collected for chum salmon from the Salmon River, Squirrel River, and in the vicinity of Selby Slough in the Kobuk River drainage. Age composition was fairly consistent with age-0.4 fish predominating in all samples (47% to 60%) to 73.9% followed by age-0.3 fish (32% to 45%) (Table 20). Mean lengths by age group for all escapement samples ranged from 510 mm for an age-0.2 male to 643 mm for age-0.6 males, both from Selby Slough vicinity.



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Table 1. Norton Sound commercial salmon effort, catch and weight (pounds) by subdistrict, 1996.

Subdistrict	Number of Fishermen <sup>a</sup>	Chinook		Sockeye		Coho		Pink		Chum		Total	
		No. Fish	Weight	No. Fish	Weight	No. Fish	Weight	No. Fish	Weight	No. Fish	Weight	No. Fish	Weight
1	1	-		-		9	67	13	70	3	25	25	162
2	4	-		-		638	4,835	-		-		638	4,835
3	12	-		-		1,915	17,662	68,609	169,091	-		70,524	186,753
4	-	-		-		-		-		-		-	-
5	20	1,340	26,007	1	8	13,444	116,010	304,982	742,598	3,237	24,861	323,004	909,484
6	54	3,644	69,787	-		52,027	434,798	113,837	284,356	7,369	59,463	176,877	848,404
Total	91	4,984	95,794	1	8	68,033	573,372	487,441	1,196,115	10,609	84,349	571,068	1,949,638

Table 2. Subsistence permit harvests of salmon in northern Norton Sound, 1996.

Location	Permits Issued <sup>a</sup>	Permits Returned <sup>a</sup>	Permits Fished	Chinook	Sockeye	Chum	Pink	Coho	Total Salmon
Marine Waters	69	31	21	7	141	1,545	1,388	244	3,325
Nome River	22	13	10	1	19	107	1,195	143	1,465
Snake River	1	1	1	-	-	-	2	1	3
Eldorado	14	9	6	-	4	414	367	169	954
Flambeau	6	6	5	-	1	39	89	-	129
Bonanza River	3	2	1	1	-	20	19	268	308
Penny River	1	1	-	-	-	-	-	-	-
Niukluk River	1	-	-	-	-	-	-	-	-
Total <sup>b</sup>	117	63	44	9	165	2,125	3,060	825	6,184

<sup>a</sup> Permits issued by the Alaska Department of Fish and Game, Division of Commercial Fisheries Management and Development Division, in Nome.

<sup>b</sup> Preliminary information.

Table 3. Estimates of subsistence harvests of salmon in the Norton Sound and Port Clarence Area, 1996.

Village	Chinook	Chum	Pink	Sockeye	Coho	Total Salmon
Nome	19	4,333	5,802	353	1,317	11,824
Golovin	56	946	5,654	70	1,077	7,803
White Mountain	26	1,835	8,372	27	1,648	11,908
Elim	400	2,205	9,263	52	1,589	13,509
Koyuk	295	4,161	3,929	3	676	9,064
Shaktoolik	1,114	4,425	8,370	31	3,615	17,555
Unalakleet	2,909	2,721	15,923	181	10,433	32,167
Stebbins	1,008	7,362	2,349	430	3,752	14,901
St. Michael	1,263	6,142	1,477	3	1,672	10,557
Brevig Mission	9	2,280	1,487	680	730	5,186
Teller	186	2,278	593	1,906	534	5,497
Total	7,285	38,688	63,219	3,736	27,043	139,971

Table 4. Salmon aerial survey escapement counts (unless otherwise noted of Norton Sound streams and associated chum salmon escapement goals, 1996.

Stream Name	Chinook	Coho	Sockeye	Pink	Chum	Chum Goal
Salmon L.			6,610			
Grand Central R.			770			
Pilgrim R.	81	1,131	1,800	9,030 <sup>c</sup>	6,870 <sup>b</sup>	
Glacial L.			1,852 <sup>a</sup>			
Sinuk R.	5	367	300	74,100 <sup>b</sup>	1,815 <sup>b</sup>	4,500
Cripple R.		41				
Penny R.		8				
Snake R.		398		4,140	405 <sup>b</sup>	1,000
Nome R.		723	11	34,520 <sup>b</sup>	799 <sup>b</sup>	2,000
Flambeau R.					5,390 <sup>b</sup>	3,250
Eldorado R.	21	254		40,100 <sup>b</sup>	23,820 <sup>b</sup>	5,250
Bonanza R.	86			40,510 <sup>b</sup>	1,980 <sup>b</sup>	1,500
Solomon R.	7	262		15,230	323	550
Fish R.	189			684,780 <sup>b</sup>	5,840 <sup>b,f</sup>	17,500
Boston Cr.	133			35,980 <sup>b</sup>	3,505 <sup>b,f</sup>	2,500
Niukluk R.	25	2,047		153,150 <sup>b</sup>	9,732 <sup>b,f</sup>	8,000
Ophir Cr.		1,271				
Kwiniuk R.	567 <sup>d</sup>	1,410		937,735 <sup>d</sup>	27,256 <sup>d</sup>	19,500 <sup>e</sup>
Tubutulik R.	439			226,750 <sup>b</sup>	10,790 <sup>b</sup>	12,000
Inglutalik R.						8,500
Ungalik R.	35			60,000 <sup>b</sup>	5,540 <sup>b</sup>	2,500
Shaktoolik R.	206	3,821		150,310 <sup>a</sup>	7,337 <sup>a,f</sup>	11,000
Unalakeet R.						
North R.	106	917		125,500 <sup>b</sup>	220 <sup>b,f</sup>	2,000
Old Woman R.	55	925		16,390 <sup>b</sup>	296 <sup>b,f</sup>	100

<sup>a</sup> Counts should be considered minimums due to counting conditions.

<sup>b</sup> Early count.

<sup>c</sup> Late count.

<sup>d</sup> Preliminary expanded tower counts.

<sup>e</sup> Chum goal for tower count.

<sup>f</sup> Pink abundance obscured chum recognition.

Table 5. Norton Sound Subdistrict 6 chinook salmon commercial catch sample age and sex composition, and mean length. 1996.

		Brood Year and (Age Group)							
		1993	1992	1991	1990		1989		Total
		(1.1)	(1.2)	(1.3)	(1.4)	(2.3)	(1.5)	(2.4)	
Stratum Dates: 6/13-6/29									
Sampling Dates: 6/15-6/21									
Sample Size: 128									
Female	Percent of Sample	0.0	0.8	11.8	20.5	0.8	3.9	0.8	38.6
	Number in Catch	0	1	15	26	1	5	1	49
	Mean length (mm) <sup>a</sup>		810.0	815.3	852.5	800.0	906.0	820.0	
Male	Percent of Sample	3.1	2.4	34.6	19.7	0.0	1.6	0.0	61.4
	Number in Catch	4	3	44	25	0	2	0	79
	Mean length (mm) <sup>a</sup>	3	600.0	746.7	814.6		1,035.0		
Total	Percent of Sample	3.1	3.1	46.5	40.2	0.8	5.5	0.8	100.0
	Number in Catch	4	4	59	51	1	7	1	128
	Standard Error	2	2	6	6	1	3	1	

<sup>a</sup> Length was from mid-eye to fork of tail.



Table 6. Unalakleet River chinook salmon test fishing sample age and sex composition, and mean length, 1996. <sup>a</sup>

		Brood Year and (Age Group)					
		1993	1992	1991	1990	1989	Total
		(1.1)	(1.2)	(1.3)	(1.4)	(1.5)	
Stratum Dates:		6/05-8/26					
Sampling Dates:		6/06-7/06					
Sample Size:		118					
Female	Percent of Sample	0.0	3.4	47.9	7.7	0.9	59.8
	Number in Catch	0	4	56	9	1	71
	Mean length (mm) <sup>b</sup>		618.8	702.6	845.0	855.0	
Male	Percent of Sample	0.9	5.1	29.9	4.3	0.0	40.2
	Number in Catch	1	6	35	5	0	47
	Mean length (mm) <sup>b</sup>		536.0	718.0	827.5		
Total	Percent of Sample	2	8.5	77.8	12.0	0.9	100.0
	Number in Catch	1	10	92	14	1	118
	Standard Error	1	3	5	4	1	

<sup>a</sup> Fish sampled from 5-7/8 inch mesh size set gillnet test fishery in the Unalakleet River.

<sup>b</sup> Length was from mid-eye to fork of tail.

Table 7. Norton Sound Subdistrict 5 chum salmon commercial catch sample age and sex composition, and mean length, 1996.

		Brood Year and (Age Group)			Total
		1989 (0.3)	1991 (0.4)	1990 (0.5)	
Stratum Dates:	6/13-8/31				
Sampling Dates:	6/25				
Sample Size:	115				
Female	Percent of Sample	24.3	27.8	5.2	57.4
	Number in Catch	28	32	6	66
	Mean length (mm) <sup>a</sup>	559.1	575.3	568.3	
Male	Percent of Sample	20.9	20.0	1.7	42.6
	Number in Catch	24	23	2	49
	Mean length (mm) <sup>a</sup>	604.8	611.7	600.0	
Total		656			
	Percent of Sample	45.2	47.8	7.0	100.0
	Number in Catch	52	55	8	115
	Standard Error	5	5	3	

<sup>a</sup> Length was from mid-eye to fork of tail.

Table 8. Norton Sound Subdistrict 6 chum salmon commercial catch sample age and sex composition, and mean length, 1996.

		Brood Year and (Age Group)				Total
		1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates:		6/13-8/31				
Sampling Dates:		7/03-7/31				
Sample Size:		152				
Female	Percent of Sample	9.2	11.8	3.3	0.0	24.3
	Number in Catch	14	18	5	0	37
	Mean length (mm) <sup>a</sup>	567.9	596.4	606.0		
Male	Percent of Sample	14.5	44.7	13.8	2.6	75.7
	Number in Catch	22	68	21	4	115
	Mean length (mm) <sup>a</sup>	619.8	642.7	634.0	620.0	
Total	Percent of Sample	23.7	56.6	17.1	2.6	100.0
	Number in Catch	36	86	26	4	152
	Standard Error	5	6	5	2	

<sup>a</sup> Length was from mid-eye to fork of tail.

Table 9. Unalakleet River chum salmon test fishing catch sample age and sex composition, and mean length, 1996. <sup>a</sup>

		Brood Year and (Age Group)					
		1993	1992	1991	1990	1989	
		(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	Total
Stratum Dates:		6/05-8/26					
Sampling Dates:		6/05-7/29					
Sample Size:		503					
Female	Percent of Sample	0.2	6.8	19.8	11.3	0.6	38.8
	Number in Catch	1	34	100	57	3	195
	Mean length (mm) <sup>b</sup>	560.0	600.0	609.4	623.9	610.0	
Male	Percent of Sample	0.2	12.8	31.8	15.9	0.6	61.2
	Number in Catch	1	64	160	80	3	308
	Mean length (mm) <sup>b</sup>	625.0	619.6	634.7	625.8	643.3	
Total	Percent of Sample	0.4	19.6	51.5	27.2	1.2	100.0
	Number in Catch	2	99	259	137	6	503
	Standard Error	1	9	11	10	2	

<sup>a</sup> Fish sampled from 5-7/8 inch mesh size set gillnet test fishery in the Unalakleet River.

<sup>b</sup> Length was from mid-eye to fork of tail.

Table 10. Norton Sound District chum salmon escapement sample age and sex composition, and mean length, 1996.

		Brood Year and (Age Group)					
		1993	1992	1991	1990	1989	Total
		(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	
Stratum Dates: 7/03-7/13		Kwiniuk River <sup>b</sup>					
Sampling Dates: 7/03-7/13							
Sample Size: 57							
Female	Percent of Sample	0.0	26.3	12.3	0.0	0.0	38.6
	Number in Sample	0	15	7	0	0	22
	Mean length (mm) <sup>a</sup>		551.4	569.3			
Male	Percent of Sample	0.0	19.3	36.8	5.3	0.0	61.4
	Number in Sample	0	11	21	3	0	35
	Mean length (mm) <sup>a</sup>		555.5	620.9	585.0		
Total	Percent of Sample	0.0	45.6	49.1	5.3	0.0	100.0
	Number in Sample	0	26	28	3	0	57
	Standard Error		4	4	2		
Stratum Dates: 7/02-9/10		Niukluk River <sup>b</sup>					
Sampling Dates: 7/02-9/10							
Sample Size: 418							
Female	Percent of Sample	0.2	17.2	23.7	5.3	0.0	46.4
	Number in Sample	1	72	99	22	0	194
	Mean length (mm) <sup>a</sup>	535.0	553.3	571.1	573.8		
Male	Percent of Sample	0.5	16.3	28.2	8.1	0.5	53.6
	Number in Sample	2	68	118	34	2	224
	Mean length (mm) <sup>a</sup>	619.5	592.0	618.5	614.4	642.5	
Total	Percent of Sample	0.7	33.5	51.9	13.4	0.5	100.0
	Number in Sample	3	140	217	56	2	418
	Standard Error	2	10	10	7	1	

<sup>a</sup> Length was from mid-eye to fork of tail.

<sup>b</sup> Kwiniuk River samples were collected by beach sein and Niukluk River samples were from carcass samples that had floated into the weir.

Table 11. Norton Sound Subdistrict 6 coho salmon commercial catch sample age and sex composition, and mean length, 1996.

		Brood Year and (Age Group)			Total
		1989 (1.1)	1992 (2.1)	1991 (3.1)	
Stratum Dates:	7/25-9/10				
Sampling Dates:	7/31-8/03				
Sample Size:	150				
Female	Percent of Sample	2.0	56.7	2.7	61.3
	Number in Catch	3	85	4	92
	Mean length (mm) <sup>a</sup>	620.0	576.4	593.8	
Male	Percent of Sample	1.3	35.3	2.0	38.7
	Number in Catch	2	53	3	58
	Mean length (mm) <sup>a</sup>	602.5	586.2	590.0	
Total		628			
	Percent of Sample	3.3	92.0	4.7	100.0
	Number in Catch	5	138	7	150
	Standard Error	2	3	3	

<sup>a</sup> Length was from mid-eye to fork of tail.

Table 12. Unalakleet River coho salmon test fishing sample age and sex composition, and mean length, 1996. <sup>a</sup>

		Brood Year and (Age Group)			Total
		1993 (1.1)	1992 (2.1)	1991 (3.1)	
Stratum Dates:		6/05-8/26			
Sampling Dates:		7/16-8/26			
Sample Size:		174			
Female	Percent of Sample	4.0	36.2	0.6	40.8
	Number in Catch	7	63	1	71
	Mean length (mm) <sup>b</sup>	588.6	609.7	630.0	
Male	Percent of Sample	6.9	50.6	1.7	59.2
	Number in Catch	12	88	3	103
	Mean length (mm) <sup>b</sup>	612.5	616.0	638.3	
Total	Percent of Sample	10.9	86.8	2.3	100.0
	Number in Catch	19	151	4	174
	Standard Error	4	4	2	

<sup>a</sup> Fish sampled from 5-7/8 inch mesh size set gillnet test fishery in the Unalakleet River.

<sup>b</sup> Length was from mid-eye to fork of tail.

Table 13. Niukluk River coho salmon sport fishing catch sample age and sex composition, and mean length, 1996.

		Brood Year and (Age Group)			Total
		1991 (1.1)	1992 (2.1)	1991 (3.1)	
Stratum Dates:	7/28-8/21				
Sampling Dates:	7/28-8/21				
Sample Size:	202				
Female	Percent of Sample	1.5	44.6	1.0	47.0
	Number in Catch	3	90	2	95
	Mean length (mm) <sup>a</sup>	568.3	609.4	605.0	
Male	Percent of Sample	7.9	44.1	1.0	53.0
	Number in Catch	16	89	2	107
	Mean length (mm) <sup>a</sup>	600.3	623.4	610.0	
		597			
Total	Percent of Sample	9.4	88.6	2.0	100.0
	Number in Catch	19	179	4	202
	Standard Error	4.2	4.5	2.0	

<sup>a</sup> Length was from mid-eye to fork of tail.



Table 14. Niukluk River coho salmon escapement sample age and sex composition, and mean length, 1996. <sup>a</sup>

		Brood Year and (Age Group)			Total
		1991 (1.1)	1992 (2.1)	1991 (3.1)	
Stratum Dates:	9/03-10/06				
Sampling Dates:	9/03-10/06				
Sample Size:	209				
Female	Percent of Sample	3.8	33.5	0.0	37.3
	Number in Sample	8	70	0	78
	Mean length (mm) <sup>b</sup>	595.6	602.2	0.0	
Male	Percent of Sample	7.2	53.6	1.9	62.7
	Number in Sample	15	112	4	131
	Mean length (mm) <sup>b</sup>	629.1	623.3	627.5	
Total	Percent of Sample	11.0	87.1	1.9	100.0
	Number in Sample	23	182	4	209
	Standard Error	4.5	4.9	2.0	

<sup>a</sup> Scale samples were collected from carcasses on the spawning grounds.

<sup>b</sup> Length was from mid-eye to fork of tail.

Table 15. Kotzebue District commercial catch, weight, and average weight of chum salmon, chinook salmon and Dolly Varden by period, 1996.

Period	Date	Hours Fished	Number of Fishermen	Chum			Chinook			Dolly Varden		
				Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.	Number	Pounds	Avg. Wt.
26	1 08-Jul-96	4	6	841	7,055	8.4						
	2 09-Jul-96	6	8	2,192	17,536	8.0 <sup>b</sup>	1	20	20.0			
	3 10-Jul-96	8	8	2,831	22,648	8.0 <sup>b</sup>						
	4 11-Jul-96	8	15	4,872	38,976	8.0 <sup>b</sup>						
	5 17-Jul-96	4	28	3,590	28,720	8.0 <sup>b</sup>						
	6 18-Jul-96	4	33	5,722	45,776	8.0 <sup>b</sup>						
	7 23-Jul-96	6	13	3,561	28,488	8.0 <sup>b</sup>				1	7	7.0
	8 24-Jul-96	8	16	4,859	38,888	8.0 <sup>b</sup>						
	9 25-Jul-96	8	8	2,357	18,856	8.0 <sup>b</sup>	1	6	6.0			
	10 26-Jul-96	8	24	7,830	62,640	8.0 <sup>b</sup>						
	11 29-Jul-96	6	15	4,811	38,488	8.0 <sup>b</sup>						
	12 05-Aug-96 <sup>a</sup>	6	24	10,322	82,576	8.0 <sup>b</sup>				3	17	5.7
	13 06-Aug-96	6	18	9,779	78,233	8.0 <sup>b</sup>				7	42	6.0
	14 14-Aug-96	4		Buyer did not purchase fish								
	15 16-Aug-96	4	12	4,679	37,432	8.0 <sup>b</sup>				41	214	5.2
	16 19-Aug-96	6	10	1,283	10,264	8.0 <sup>b</sup>				7	51	7.3
	17 20-Aug-96	6	11	2,700	21,600	8.0 <sup>b</sup>				45	270	6.0
	18 21-Aug-96	6	2	394	3,152	8.0 <sup>b</sup>				2	15	7.5
	19 23-Aug-96	24	14	7,287	58,296	8.0 <sup>b</sup>	1	25	25.0	82	537	6.5
Totals		132	55	79,910	639,624	8.0	3	51	17.0	188	1,153	6.1

<sup>a</sup> Does not include 2,200 chum salmon that were commercially caught but not sold or harvested for subsistence.

<sup>b</sup> No salmon were weighed. An average weight of 8 pounds was assumed.

Table 16. Estimates of subsistence harvests of salmon, sheefish and Dolly Varden in the Kotzebue Sound Area. 1996.

Village	Chinook	Chum	Pink	Sockeye	Coho	Total Salmon	Sheefish	Dolly Varden
Kotzebue	505	50,573	288	468	42	51,876	<sup>a</sup>	<sup>a</sup>
Noorvik	38	13,347	596	-	256	14,237	3,362	<sup>a</sup>
Kiana	6	5,899	-	-	12	5,917	1,003	<sup>a</sup>
Ambler	1	7,940	64	2	-	8,007	1,215	<sup>a</sup>
Shungnak	-	8,095	-	-	-	8,095	924	<sup>a</sup>
Kobuk	-	2,010	-	-	1	1,821	450	<sup>a</sup>
Noatak	-	10,091	-	1	-	10,092	<sup>a</sup>	5,692
Total	550	97,955	948	471	311	100,045	6,954	5,692

<sup>a</sup> Not surveyed for this species.

Table 17. Kotzebue District chum salmon aerial survey escapement indices for primary index streams, 1962-1996. Indices listed in this table are the peak survey observed for each tributary during the given year. <sup>a</sup>

Year	Noatak River (80,000)	Eli River (5,000)	Noatak River Drainage (85,000)	Squirrel River (11,500)	Salmon River (7,000)	Tutuksuk River (2,000)	Upper Kobuk Mainstem (10,000)
1962	168,000	9,080	177,080	5,384	12,936	10,841	9,224
1963	1,970 <sup>b</sup>	35 <sup>b</sup>	2,005 <sup>b</sup>	2,200	1,535	670	4,535
1964	89,798		89,798	8,009	9,353	2,685	7,985
1965	6,152 <sup>b</sup>		6,152	7,230	1,500 <sup>b</sup>		2,750
1966	101,640	120	101,760	1,350	3,957	1,383	1,474
1967	29,120 <sup>b</sup>		29,120 <sup>b</sup>	3,332	2,116	169	2,495
1968	39,394	5,502	44,896	6,746	3,367	823	2,370
1969	33,945	68	34,013	6,714	2,561	159	7,500 <sup>c</sup>
1970	138,145		138,145	4,418	3,000 <sup>b</sup>	2,000 <sup>b</sup>	13,908
1971	41,056		41,056	6,628	5,453	1,384	17,202
1972	64,315 <sup>b</sup>	3,286 <sup>b</sup>	67,601 <sup>b</sup>	32,126	2,073 <sup>b</sup>		18,155
1973	32,144		32,144	12,345	6,891		2,470 <sup>b</sup>
1974	713,535	22,249	735,784	32,523	29,190	8,312	28,120
1975	96,509	1,302	97,811	32,256	9,721	1,344 <sup>b</sup>	10,702
1976	44,574	1,205	45,779	7,229	1,161	758	2,522 <sup>b</sup>
1977	11,221 <sup>b</sup>	742 <sup>b</sup>	11,963 <sup>b</sup>	1,964 <sup>b</sup>			
1978	37,817	5,525	43,342	1,863	814 <sup>b</sup>	368 <sup>b</sup>	1,981 <sup>b</sup>
1979	15,721 <sup>b</sup>	1,794 <sup>b</sup>	17,515 <sup>b</sup>	1,500 <sup>b</sup>	674 <sup>b</sup>	382 <sup>b</sup>	2,008
1980	164,474	10,277	174,751	13,563	8,456	1,165	11,472
1981	116,352		116,352	9,854	4,709	1,114	8,648
1982	20,682 <sup>b</sup>	189 <sup>b</sup>	20,871 <sup>b</sup>	7,690	1,821 <sup>c</sup>	1,322	14,674
1983	79,773	3,044	82,817	5,115	1,677	2,637	33,746
1984	67,873	5,027	72,900	5,473	1,471	1,132	10,621
1985	45,525 <sup>b</sup>	855 <sup>a</sup>	46,380 <sup>b</sup>	6,160	2,884	5,089	6,278
1986	37,227 <sup>b</sup>	4,308 <sup>b</sup>	41,535 <sup>b</sup>	4,982	1,971	4,257	6,015
1987	5,515 <sup>b</sup>	2,780 <sup>b</sup>	8,295 <sup>b</sup>	2,708 <sup>c</sup>	3,333	206	8,210
1988	45,930 <sup>b</sup>	8,639 <sup>b</sup>	54,569 <sup>b</sup>	4,848 <sup>b</sup>	6,208	3,122	11,895 <sup>b</sup>
1989 <sup>d</sup>							
1990	23,345 <sup>b</sup>	3,000	26,345	5,500	6,335	2,275	15,355
1991	82,750	2,940	85,690	4,606	5,845	744	24,525
1992	34,335 <sup>b</sup>	701 <sup>b</sup>	35,036 <sup>a</sup>	2,765	1,345	1,162	11,803
1993	25,415 <sup>b</sup>	4,795	30,210 <sup>b</sup>	4,463	13,880	1,196	12,158
1994 <sup>d</sup>							
1995	159,260	7,860	167,120	10,605	13,988	3,901	35,725
1996	306,900	30,040	336,940	21,795	21,740	8,200	74,770

<sup>a</sup> Three aerial surveys are attempted yearly at different intervals for each tributary to assess escapements prior to the peak, during the peak and after the peak of the run. Indices listed in this table are the largest survey observed for each tributary during the given year. Escapement goals are shown in parentheses for each index area.

<sup>b</sup> Poor survey conditions or incomplete, early or late survey.

<sup>c</sup> Survey by foot or boat.

<sup>d</sup> Unacceptable conditions.

Table 18. Kotzebue District chum salmon commercial catch age and sex composition, and mean length, 1996.

		Brood Year and (Age Group)					
		1993	1992	1991	1990	1989	Total
		(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	
Stratum Dates:		7/08-8/26					
Sampling Dates:		7/08-8/26					
Sample Size:		2,386					
Female	Percent of Sample	0.4	20.7	25.4	4.0	0.1	50.4
	Number in Catch	283	16,534	20,262	3,158	46	40,282
	Mean length (mm) <sup>a</sup>	558.2	586.3	606.4	608.2	631.5	
Male	Percent of Sample	0.6	20.0	23.6	5.1	0.4	49.6
	Number in Catch	452	15,983	18,845	4,040	309	39,628
	Mean length (mm) <sup>a</sup>	561.7	608.9	631.6	638.7	642.4	
Total	Percent of Sample	0.9	40.7	48.9	9.0	0.4	100.0
	Number in Catch	735	32,518	39,106	7,197	354	79,910
	Standard Error	156	804	818	468	109	

<sup>a</sup> Length was from mid-eye to fork of tail.

Table 19. Kobuk and Noatak River drift test fishing catch sample age and sex composition, and mean length. 1996.

		Brood Year and (Age Group)					
		1993	1992	1991	1990	1989	Total
		(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	
Stratum Dates: 7/09-8/18		Kobuk River <sup>a</sup>					
Sampling Dates: 7/09-8/18							
Female	Percent of Sample	0.2	13.4	28.0	3.5	0.1	45.2
	Sample Size	3	219	458	57	1	738
	Mean length (mm) <sup>b</sup>	591.7	598.6	610.6	618.4	645.0	
Male	Percent of Sample	0.3	18.5	30.3	5.4	0.2	54.8
	Sample Size	5	303	495	88	4	895
	Mean length (mm) <sup>b</sup>	570.0	615.0	636.2	635.6	643.0	
Total	Percent of Sample	1,170	31.9	58.4	8.9	0.3	100.0
	Sample Size	8	521	953	145	5	1,633
	Standard Error	3	19	20	12	2	
Stratum Dates: 7/28-8/27		Noatak River <sup>a</sup>					
Sampling Dates: 7/28-8/27							
Female	Percent of Sample	0.6	24.6	26.1	3.8	0.0	54.5
	Number in Catch	2	85	90	13	0	188
	Mean length (mm) <sup>b</sup>	546.5	592.8	604.4	615.5		
Male	Percent of Sample	0.0	22.6	19.7	3.2	0.0	45.5
	Number in Catch	0	78	68	11	0	157
	Mean length (mm) <sup>b</sup>		608.0	630.8	639.4	608.0	
Total	Percent of Sample	0.6	47.2	45.8	7.0	0.0	100.0
	Number in Catch	2	163	158	24	0	345
	Standard Error	0	3	3	1	0	

<sup>a</sup> Fish sampled from 6 inch mesh size drift gillnet.

<sup>b</sup> Length was from mid-eye to fork of tail.

Table 20. Kotzebue District chum salmon tributary escapement sample age and sex composition, and mean length, 1996.

		Brood Year and(Age Group)					Total
		1991 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates: 8/27-8/28		Squirrel River <sup>a</sup>					
Sampling Dates: 8/27-8/28							
Sample Size: 271							
Female	Percent of Sample	0.4	21.0	35.1	5.2	0.0	61.6
	Number in Sample	1	57	95	14	0	167
	Mean length (mm) <sup>b</sup>	560.0	564.2	580.7	581.1		
Male	Percent of Sample	0.0	11.8	21.8	4.8	0.0	38.4
	Number in Sample	0	32	59	13	0	104
	Mean length (mm) <sup>b</sup>		621.3	629.7	630.4		
Total		561					
Total	Percent of Sample	0.4	32.8	56.8	10.0	0.0	100.0
	Number in Sample	1	89	154	27	0	271
	Standard Error	1.0	7.7	8.2	4.9		
Stratum Dates: 8/19-8/21		Salmon River <sup>a</sup>					
Sampling Dates: 8/19-8/21							
Sample Size: 267							
Female	Percent of Sample	0.4	10.9	21.3	4.1	0.0	36.7
	Number in Sample	1	29	57	11	0	98
	Mean length (mm) <sup>b</sup>	610.0	566.4	583.7	587.7		
Male	Percent of Sample	0.0	20.6	38.2	4.5	0.0	63.3
	Number in Sample	0	55	102	12	0	169
	Mean length (mm) <sup>b</sup>		615.6	636.4	630.8		
Total							
Total	Percent of Sample	0.4	31.5	59.6	8.6	0.0	100.0
	Number in Sample	1	84	159	23	0	267
	Standard Error	1.0	7.6	8.0	4.6		
Stratum Dates: 9/02-9/03		Selby Sough vicinity <sup>a</sup>					
Sampling Dates: 9/02-9/03							
Sample Size: 270							
Female	Percent of Sample	0.8	25.8	29.2	1.9	0.0	57.8
	Number in Sample	2	70	79	5	0	156
	Mean length (mm) <sup>b</sup>	580.0	567.9	579.7	576.0		
Male	Percent of Sample	0.4	19.1	17.6	3.4	1.5	42.2
	Number in Sample	1	52	48	9	4	114
	Mean length (mm) <sup>b</sup>	510.0	598.2	613.6	603.3	642.5	
Total							
Total	Percent of Sample	1.2	45.0	46.9	5.3	1.5	100.0
	Number in Sample	3	121	127	14	4	270
	Standard Error	1.8	8.2	8.2	3.7	2.0	

<sup>a</sup> Samples were collected from carcasses on the spawning grounds.

<sup>b</sup> Length is measured from mid-eye to fork-of-tail.

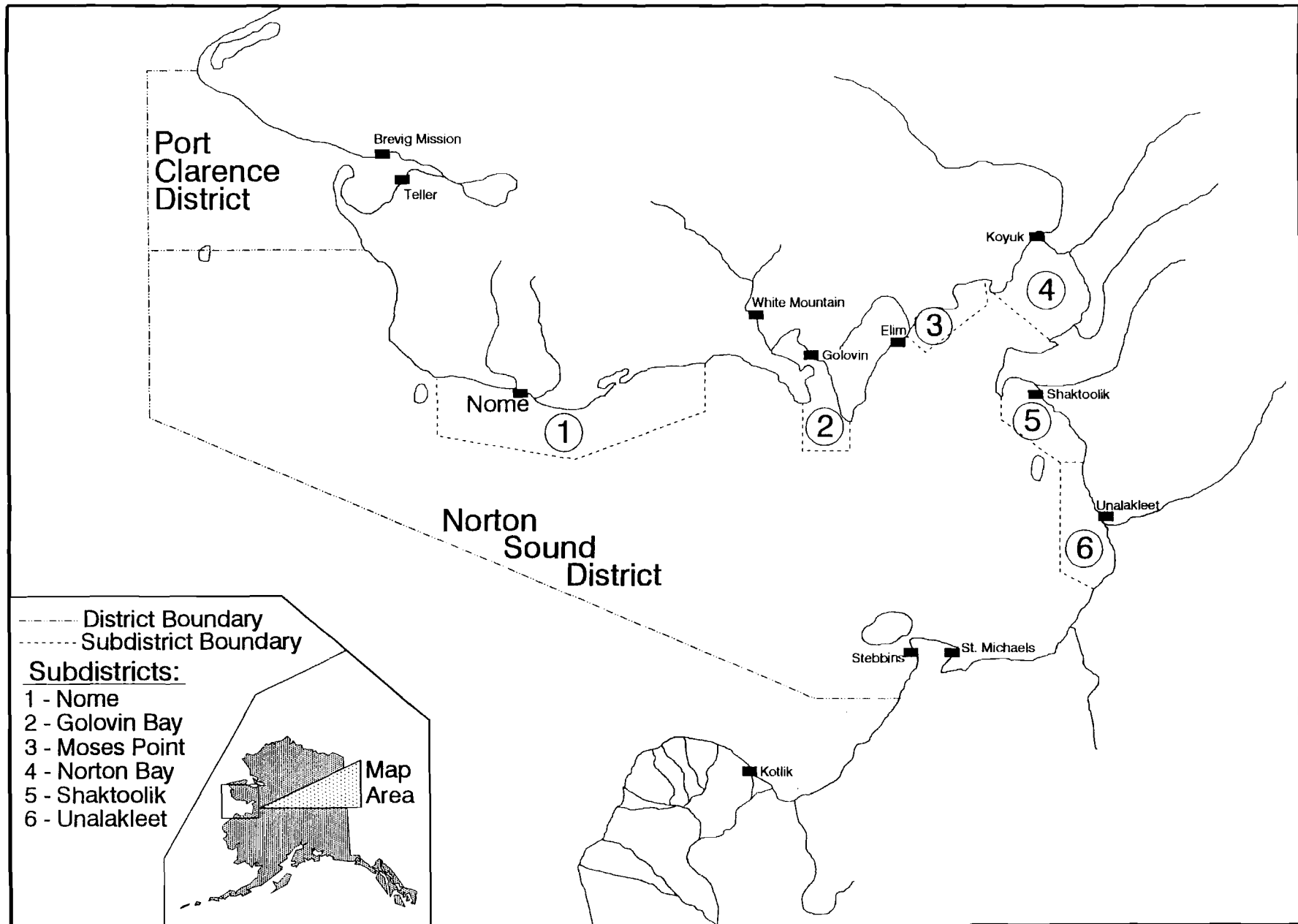


Figure 1. Norton Sound commercial salmon fishing subdistricts.



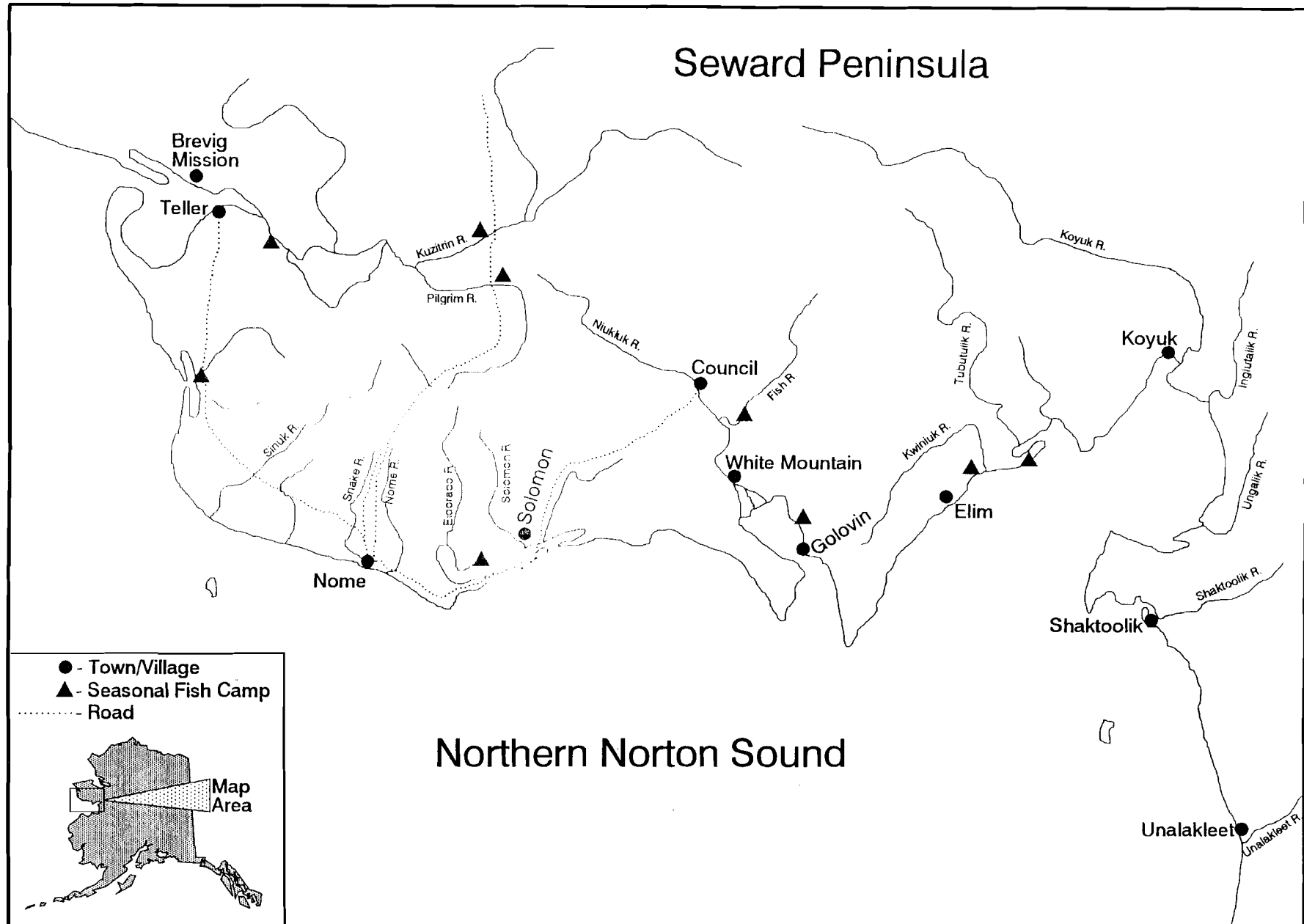


Figure 2. Northern Norton Sound subsistence fishing areas.

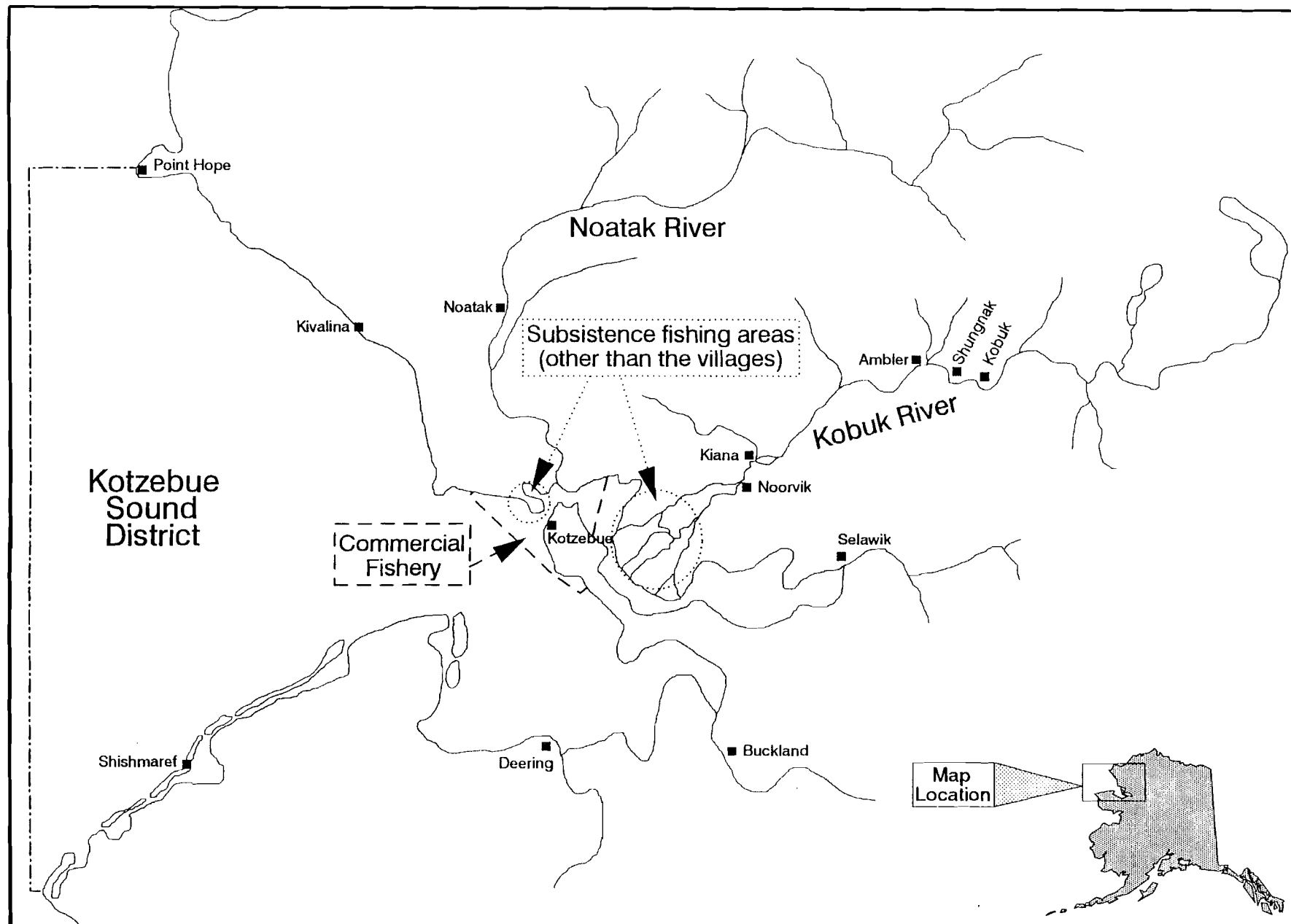


Figure 3. Kotzebue Sound commercial fishing district, villages and subsistence fishing areas.

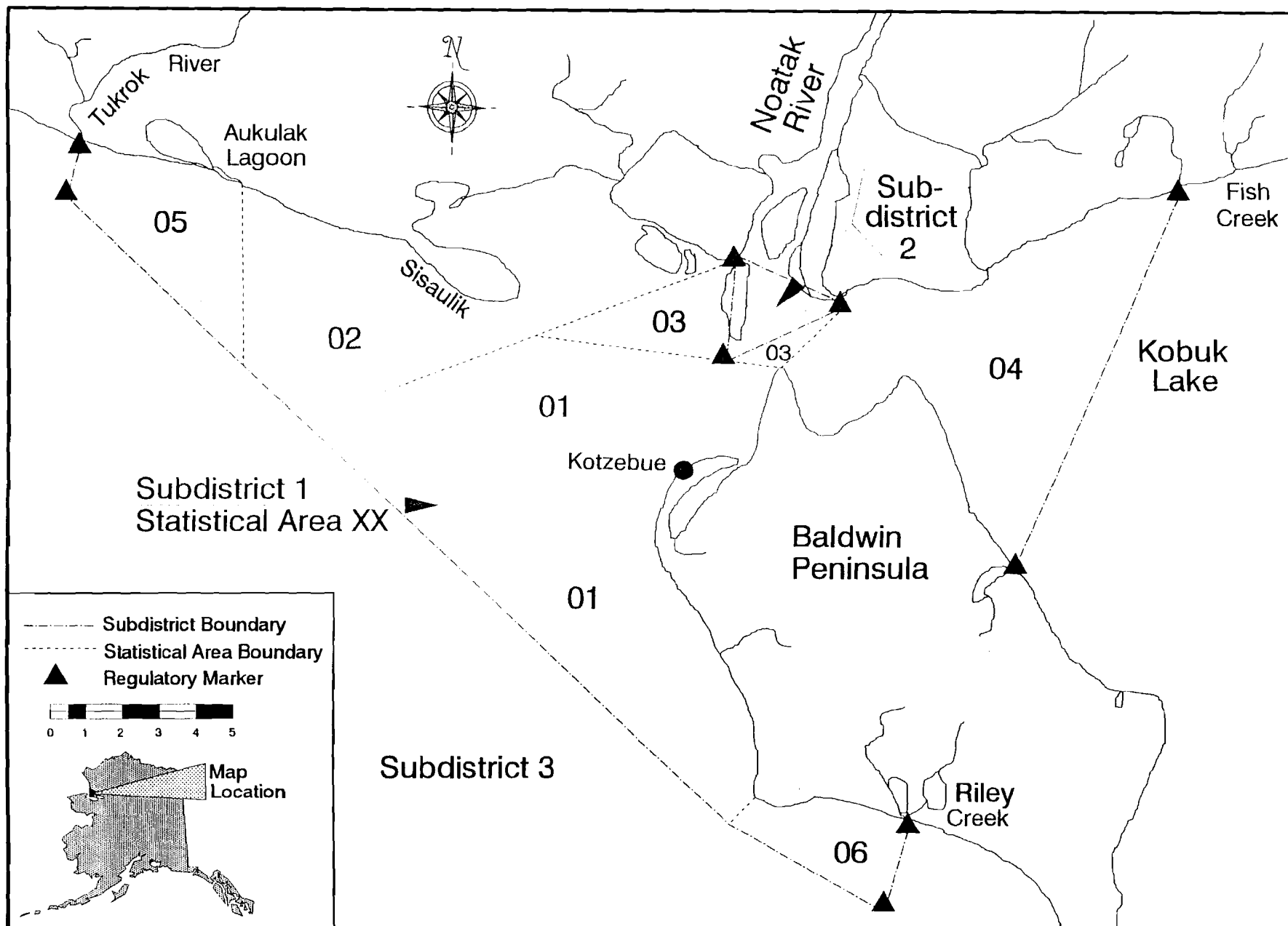


Figure 4. Kotzebue Sound commercial fishing subdistricts and statistical areas.

Appendix Table A 1 Norton Sound Subdistrict 1 commercial salmon catch and effort by period, 1996.

Period Number	Target Species	Period Dates	Hours Open	Actual Hours Fished	Number of Fishermen	Number of Salmon					Total
						Chinook	Sockeye	Chum	Pink	Coho	
1	Coho	8/05-8/06	24	24	1	0	0	0	13	0	13
2	Coho	8/08-8/09	24		0			No Deliveries			
3	Coho	8/12-8/13	24		0			No Deliveries			
4	Coho	8/15-8/16	24		0			No Deliveries			
5	Coho	8/19-8/20	24		0			No Deliveries			
6	Coho	8/22-8/23	24	24	1	0	0	3	0	9	12
7	Coho	8/26-8/27	24		0			No Deliveries			
8	Coho	8/29-8/30	24		0			No Deliveries			
Total			192	48	1	0	0	3	13	9	25

Appendix Table A 2. Norton Sound Subdistrict 2 commercial salmon catch and effort by period, 1996.

Period Number	Target Species	Period Dates	Hours Open	Actual Hours Fished	Number of Fishermen	Number of Salmon					Total
						Chinook	Sockeye	Chum	Pink	Coho	
1	Coho	8/05-8/07	48					No Deliveries			
2	Coho	8/08-8/10	48	48	2	0	0	0	0	481	481
3	Coho	8/12-8/14	48	48	3	0	0	0	0	87	87
4	Coho	8/15-8/17	48					No Deliveries			
5	Coho	8/19-8/21	48	48	2	0	0	0	0	70	70
6	Coho	8/22-8/24	48					No Deliveries			
7	Coho	8/26-8/28	48					No Deliveries			
8	Coho	8/29-8/31	48					No Deliveries			
Total			384	144	4	0	0	0	0	638	638

Appendix Table A.3. Norton Sound Subdistrict 3 commercial salmon catch and effort by period, 1996.

Period Number	Target Species	Period Dates	Hours Fished <sup>a</sup>	Number of Fishermen	Number of Salmon					Total
					Chinook	Sockeye	Chum	Pink	Coho	
1	Pink	7/07	12	11	0	0	0	4,573	0	4,573
2	Pink	7/08-7/09	10	7	0	0	0	4,027	0	4,027
3	Pink	7/09-7/10	10	12	0	0	0	13,090	0	13,090
4	Pink	7/10-7/11	16	6	0	0	0	4,254	0	4,254
5	Pink	7/11-7/12	12	6	0	0	0	5,526	0	5,526
6	Pink	7/14	17	10	0	0	0	9,447	0	9,447
7	Pink	7/15-7/16	40	10	0	0	0	13,755	0	13,755
8	Pink	7/16-7/17	24	8	0	0	0	4,107	0	4,107
9	Pink	7/17-7/18	28	9	0	0	0	9,830	0	9,830
10	Coho	8/12-8/14	48	8	0	0	0	0	353	353
11	Coho	8/15-8/17	48	8	0	0	0	0	442	442
12	Coho	8/19-8/21	48	10	2	0	0	0	778	780
13	Coho	8/22-8/24	48	8	0	0	0	0	342	342
Total			265	12	2	0	0	64,036	1,915	65,953

<sup>a</sup> Commercial opening was continuous from July 7 through July 25. The salmon buyer set the fishing schedule.

Appendix Table A 4. Norton Sound Subdistrict 5 commercial salmon catch and effort by period, 1996.

Period Number	Target Species	Period Dates	Hours Open	Actual Hours Fished <sup>a</sup>	Number of Fishermen	Number of Salmon					Total
						Chinook	Sockeye	Chum	Pink	Coho	
1	King	6/13-6/15	48	48	15	469	0	185	0	0	654
2	King	6/17-6/19	48	48	13	356	0	163	0	0	519
3	King	6/20-6/22	48	48	12	322	0	265	0	0	587
4	Pink	6/24-6/25	24	24	11	0	0	0	14,531	0	14,531
5	King	6/24-6/26	48	48	13	174	1	939	0	0	1,114
6	Pink	6/26-6/28	35	35	13	4	0	0	26,874	0	26,878
7	King	6/27-6/29	48	48	9	11		122	0	0	133
8	Pink	6/28-6/29	24	24	15	0	0	0	15,182	0	15,182
9	King	7/01-7/03	48	48	9	0	0	0	0	0	-
10	Pink	7/01-7/03	51	51	10	0	0	0	19,445	0	19,445
11	Pink	7/03-7/04	24	24	12	0	0	0	24,450	0	24,450
12	Pink	7/05-7/06	12	12	14	0	0	0	33,754	0	33,754
13	Pink	7/07	12	12	15	0	0	0	39,518	0	39,518
14	Pink	7/08-7/09	10	10	16	0	0	0	18,258	0	18,258
15	Pink	7/09-7/10	10	10	18	0	0	0	41,857	0	41,857
16	Pink	7/10-7/11	16	16	7	0	0	0	9,952	0	9,952
17	Pink	7/11-7/12	12	12	15	0	0	0	16,555	0	16,555
18	Pink	7/12-7/13	30	30	10	0	0	0	15,829	0	15,829
19	Pink	7/13-7/14	16	16	7	0	0	0	6,304	0	6,304
20	Pink	7/15-7/16	40	40	12	0	0	0	18,096	0	18,096
21	Pink	7/16-7/18	48	48	7	0	0	0	4,377	0	4,377
22	Coho	7/25-7/27	48	48	4	0	0	138	0	471	609
23	Coho	7/29-7/31	48	48	15	1	0	380	0	3,696	4,077
24	Coho	8/01-8/03	48	48	1	0	0	0	0	27	27
25	Coho	8/05-8/07	54	54	15	0	0	278	0	2,279	2,557
26	Coho	8/08-8/10	66	66	6	1	0	177	0	751	929
27	Coho	8/12-8/17	120	120	11	2	0	418	0	1,986	2,406
28	Coho	8/19-8/24	120	120	12	0	0	172	0	4,209	4,381
29	Coho	8/26-8/31	120	120	1	0	0	0	0	25	25
30	Coho	9/02-9/07	120	0	0			No Deliveries			-
31	Coho	9/08-9/10	56	0	0			No Deliveries			-
Total			1,452	1,276	20	1,340	1	3,237	304,982	13,444	323,004

<sup>a</sup> Commercial opening was continuous from June 26 through July 20. The salmon buyer set the fishing schedule.

Appendix Table A.5 Norton Sound Subdistrict 6 commercial salmon catch and effort by period, 1996

Period Number	Target Species	Period Dates	Hours Fished	Number of Fishermen	Number of Salmon					Total
					Chinook	Sockeye	Chum	Pink	Coho	
1	King	6/13-6/15	48	27	545	0	243	0	0	788
2	King	6/17-6/19	48	26	770	0	355	0	0	1,125
3	King	6/20-6/22	48	31	862	0	595	0	0	1,457
4	Pink	6/24-6/25	24	7	0	0	0	5,489	0	5,489
5	King	6/24-6/26	48	32	825	0	1,235	0	0	2,060
6	Pink	6/26-6/28	35	1	0	0	0	1,166	0	1,166
7	King	6/27-6/29	48	18	432	0	547	0	0	979
8	Pink	6/28-6/29	24	2	0	0	0	2,247	0	2,247
9	King	7/01-7/03	48	24	210	0	735	0	0	945
10	Pink	7/01-7/03	51	13	0	0	0	20,100	0	20,100
11	Pink	7/03-7/04	24	13	0	0	0	16,872	0	16,872
12	Pink	7/05-7/06	12	7	0	0	0	17,802	0	17,802
13	Pink	7/07-7/07	12	12	0	0	0	25,347	0	25,347
14	Pink	7/08-7/09	10	12	0	0	0	9,088	0	9,088
15	Pink	7/09-7/10	10	6	0	0	0	4,845	0	4,845
16	Pink	7/10-7/11	16	8	0	0	0	5,064	0	5,064
17	Pink	7/11-7/12	12	6	0	0	0	5,817	0	5,817
18	Pink	7/12-7/13	30	0			No Deliveries			
19	Pink	7/13-7/14	16	0			No Deliveries			
20	Pink	7/15-7/16	40	0			No Deliveries			
21	Pink	7/16-7/16	48	0			No Deliveries			
22	Coho	7/25-7/27	48	13	0	0	679	0	3,749	4,428
23	Coho	7/29-7/31	48	38	0	0	729	0	10,113	10,842
24	Coho	8/01-8/03	48	5	0	0	59	0	1,508	1,567
25	Coho	8/05-8/07	54	34	0	0	469	0	11,594	12,063
26	Coho	8/08-8/10	66	25	0	0	326	0	5,287	5,613
27	Coho	8/12-8/17	120	31	0	0	850	0	7,922	8,772
28	Coho	8/19-8/24	120	29	0	0	422	0	8,927	9,349
29	Coho	8/26-8/31	120	21	0	0	125	0	2,396	2,521
30	Coho	9/02-9/07	120	6	0	0	0	0	447	447
31	Coho	9/09-9/10	24	1	0	0	0	0	84	84
Total			1,420	54	3,644	0	7,369	113,837	52,027	176,877



Appendix Table B.1. Unalakleet River chum salmon test fishing age and sex composition by time period, 1996.

		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates: 6/05-6/15 Sampling Dates: 6/05-6/16							
Female	Number in Catch	1	14	45	23	0	84
	Percent of Sample	0.6	7.7	24.9	12.7	0.0	45.9
Male	Number in Catch	1	12	56	29	1	99
	Percent of Sample	0.6	6.6	30.4	16.0	0.6	54.1
Total	Number in Catch	2	26	101	53	1	183
	Percent of Sample	1.1	14.4	55.2	28.7	0.6	100.0
		Standard Error	1	3	4	3	1
Stratum Dates: 6/16-6/30 Sampling Dates: 6/16-6/31							
Female	Number in Catch	0	7	33	23	0	62
	Percent of Sample	0.0	3.3	16.6	11.6	0.0	31.5
Male	Number in Catch	0	30	72	32	1	135
	Percent of Sample	0.0	15.5	36.5	16.0	0.6	68.5
Total	Number in Catch	0	37	104	54	1	197
	Percent of Sample	0.0	18.8	53.0	27.6	0.6	100.0
		Standard Error	0	3	4	3	1
Stratum Dates: 7/01-7/15 Sampling Dates: 7/01-7/16							
Female	Number in Catch	0	2	13	10	0	25
	Percent of Sample	0.0	2.9	19.1	14.7	0.0	36.8
Male	Number in Catch	0	10	23	9	1	43
	Percent of Sample	0.0	14.7	33.8	13.2	1.5	63.2
Total	Number in Catch	0	12	36	19	1	68
	Percent of Sample	0.0	17.6	52.9	27.9	1.5	100.0
		Standard Error	0	5	6	5	1
Stratum Dates: 7/16-7/28 Sampling Dates: 7/16-7/27							
Female	Number in Catch	0	11	10	7	3	31
	Percent of Sample	0.0	13.4	12.2	8.5	3.7	37.8
Male	Number in Catch	0	15	22	14	0	51
	Percent of Sample	0.0	18.3	26.8	17.1	0.0	62.2
Total	Number in Catch	0	26	32	21	3	82
	Percent of Sample	0.0	31.7	39.0	25.6	3.7	100.0
		Standard Error	0	5	5	2	
Stratum Dates: 6/05-7/28 Sampling Dates: 6/05-7/27							
			Season Total				
Female	Number in Catch	1	34	101	63	3	202
	Percent of Sample	0.2	6.4	19.1	11.9	0.6	38.1
Male	Number in Catch	1	68	172	84	3	328
	Percent of Sample	0.2	12.8	32.5	15.8	0.6	61.9
Total	Number in Catch	2	101	274	147	6	530
	Percent of Sample	0.4	19.1	51.6	27.7	1.2	100.0
		Standard Error	0	2	2	2	0

Appendix Table C.2. Nome River weir expanded daily and cumulative counts of chum, pink, chinook and coho salmon and Dolly Varden, 1996.

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon		Dolly Varden	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
26-Jun	0	0	0	0	0	0	0	0	0	0
27-Jun	0	0	0	0	0	0	0	0	3	3
28-Jun	0	0	0	0	0	0	0	0	0	3
29-Jun	0	0	0	0	0	0	0	0	0	3
30-Jun	12	12	0	0	0	0	0	0	0	3
1-Jul	0	12	0	0	0	0	0	0	0	3
2-Jul	0	12	0	0	0	0	0	0	0	3
3-Jul	6	18	4	4	0	0	0	0	4	7
4-Jul	76	94	1,200	1,204	0	0	0	0	0	7
5-Jul	134	228	0	1,204	0	0	0	0	0	7
6-Jul	119	347	26	1,230	0	0	0	0	3	10
7-Jul	69	416	42	1,272	0	0	0	0	0	10
8-Jul	300	716	86	1,358	0	0	3	3	1	11
9-Jul	579	1,295	10,928	12,286	4	4	23	26	0	11
10-Jul	251	1,546	11,045	23,331	0	4	6	32	1	12
11-Jul	152	1,698	7,701	31,032	0	4	2	34	0	12
12-Jul	330	2,028	12,056	43,088	0	4	4	38	1	13
13-Jul	260	2,288	7,832	50,920	0	4	8	46	0	13
14-Jul	306	2,594	13,281	64,201	0	4	2	48	2	15
15-Jul	4	2,598	253	64,454	0	4	0	48	0	15
16-Jul	42	2,640	2,206	66,660	0	4	1	49	0	15
17-Jul	43	2,683	1,415	68,075	1	5	5	54	0	15
18-Jul	86	2,769	2,063	70,138	0	5	1	55	1	16
19-Jul	130	2,899	4,309	74,447	0	5	0	55	0	16
20-Jul	81	2,980	2,397	76,844	0	5	3	58	0	16
21-Jul	22	3,002	1,275	78,119	0	5	2	60	0	16
22-Jul	82	3,084	6,314	84,433	0	5	3	63	2	18
23-Jul	255	3,339	11,248	95,681	0	5	3	66	0	18

Appendix Table C.3. Niukluk River tower expanded daily and cumulative counts of chinook, pink, chum and coho salmon, and Dolly Varden, 1996.

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon		Dolly Varden	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
23-Jun	80	80	20	20	0	0	0	0	8	8
24-Jun	456	536	68	88	0	0	0	0	14	22
25-Jun	470	1,006	140	228	0	0	0	0	26	48
26-Jun	63	1,069	138	366	0	0	0	0	8	56
27-Jun	1,299	2,368	207	573	0	0	0	0	5	61
28-Jun	2,536	4,904	276	849	0	0	0	0	2	63
29-Jun	2,780	7,684	1,022	1,871	0	0	0	0	8	71
30-Jun	2,339	10,023	1,716	3,587	0	0	0	0	8	79
1-Jul	1,071	11,094	1,649	5,236	4	4	0	0	8	87
2-Jul	2,008	13,102	4,978	10,214	9	13	0	0	12	99
3-Jul	3,336	16,438	3,540	13,754	30	43	2	2	10	109
4-Jul	3,198	19,636	6,434	20,188	30	73	1	3	8	117
5-Jul	3,060	22,696	9,328	29,516	30	103	0	3	6	123
6-Jul	5,438	28,134	33,679	63,195	32	135	0	3	22	145
7-Jul	4,661	32,795	47,413	110,608	12	147	0	3	39	184
8-Jul	4,758	37,553	75,705	186,313	28	175	0	3	85	269
9-Jul	5,126	42,679	124,230	310,543	12	187	2	5	188	457
10-Jul	3,600	46,279	104,368	414,911	4	191	6	11	178	635
11-Jul	2,312	48,591	55,808	470,719	2	193	3	14	104	739
12-Jul	1,024	49,615	7,247	477,966	0	193	0	14	29	768
13-Jul	2,104	51,719	25,116	503,082	2	195	16	30	41	809
14-Jul	4,812	56,531	101,013	604,095	2	197	17	47	46	855
15-Jul	2,422	58,953	68,126	672,221	2	199	17	64	10	865
16-Jul	2,672	61,625	68,675	740,896	0	199	3	67	4	869
17-Jul	2,100	63,725	60,150	801,046	2	201	10	77	4	873
18-Jul	1,928	65,653	54,108	855,154	3	204	10	87	5	878
19-Jul	1,756	67,409	48,066	903,220	4	208	10	97	6	884
20-Jul	2,922	70,331	76,038	979,258	0	208	43	140	2	886
21-Jul	883	71,214	31,445	1,010,703	0	208	9	149	6	892
22-Jul	689	71,903	15,786	1,026,489	2	210	5	154	2	894
23-Jul	786	72,689	20,795	1,047,284	4	214	11	165	6	900
24-Jul	892	73,581	15,280	1,062,564	0	214	18	183	4	904
25-Jul	802	74,383	13,581	1,076,145	1	215	41	224	9	913
26-Jul	724	75,107	12,100	1,088,245	1	216	60	284	9	922
27-Jul	701	75,808	11,878	1,100,123	1	217	60	344	9	931
28-Jul	617	76,425	10,305	1,110,428	1	218	82	426	9	940
29-Jul	527	76,952	8,695	1,119,123	1	219	98	524	9	949
30-Jul	457	77,409	7,248	1,126,371	1	220	110	634	12	961
31-Jul	359	77,768	5,545	1,131,916	1	221	153	787	13	974
1-Aug	323	78,091	7,241	1,139,157	2	223	162	949	13	987
2-Aug	255	78,346	5,260	1,144,417	2	225	175	1,124	13	1,000
3-Aug	158	78,504	2,931	1,147,348	2	227	197	1,321	13	1,013
4-Aug	146	78,650	3,295	1,150,643	3	230	222	1,543	17	1,030
5-Aug	199	78,849	1,939	1,152,582	4	234	216	1,759	8	1,038
6-Aug	132	78,981	670	1,153,252	2	236	114	1,873	10	1,048
7-Aug	57	79,038	213	1,153,465	2	238	42	1,915	18	1,066
8-Aug	120	79,158	222	1,153,687	0	238	212	2,127	4	1,070
9-Aug	120	79,278	177	1,153,864	0	238	259	2,386	5	1,075
10-Aug	120	79,398	133	1,153,997	0	238	306	2,692	6	1,081
11-Aug	133	79,531	40	1,154,037	2	240	395	3,087	8	1,089
12-Aug	36	79,567	142	1,154,179	0	240	278	3,365	15	1,104
13-Aug	84	79,651	116	1,154,295	0	240	232	3,597	8	1,112
14-Aug	59	79,710	35	1,154,330	0	240	429	4,026	8	1,120

(continued)

Appendix Table C.3. (Page 2 of 2).

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon		Dolly Varden	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
15-Aug	14	79,724	26	1,154,356	2	242	1,678	5,704	30	1,150
16-Aug	20	79,744	17	1,154,373	1	243	1,154	6,858	58	1,208
17-Aug	25	79,769	7	1,154,380	0	243	631	7,489	86	1,294
18-Aug	25	79,794	57	1,154,437	0	243	485	7,974	128	1,422
19-Aug	26	79,820	91	1,154,528	0	243	356	8,330	191	1,613
20-Aug	18	79,838	110	1,154,638	0	243	243	8,573	111	1,724
21-Aug	4	79,842	12	1,154,650	0	243	410	8,983	237	1,961
22-Aug	4	79,846	24	1,154,674	0	243	482	9,465	160	2,121
23-Aug	20	79,866	-2	1,154,672	0	243	373	9,838	139	2,260
24-Aug	40	79,906	-14	1,154,658	0	243	399	10,237	143	2,403
25-Aug	16	79,922	46	1,154,704	0	243	738	10,975	247	2,650
26-Aug	17	79,939	29	1,154,733	0	243	418	11,393	102	2,752
27-Aug	33	79,972	9	1,154,742	0	243	47	11,440	36	2,788
28-Aug	14	79,986	31	1,154,773	0	243	172	11,612	60	2,848
29-Aug	26	80,012	20	1,154,793	0	243	294	11,906	68	2,916
30-Aug	25	80,037	22	1,154,815	0	243	211	12,117	64	2,980
31-Aug	18	80,055	20	1,154,678	0	243	177	12,294	62	3,042
1-Sep	17	80,072	22	1,154,700	0	243	94	12,388	56	3,098
2-Sep	28	80,100	20	1,154,720	0	243	74	12,462	41	3,139
3-Sep	20	80,120	9	1,154,729	0	243	91	12,553	155	3,294
4-Sep	16	80,136	4	1,154,733	0	243	43	12,596	141	3,435
5-Sep	4	80,140	2	1,154,735	0	243	76	12,672	162	3,597
6-Sep	12	80,152	6	1,154,741	0	243	61	12,733	132	3,729
7-Sep	20	80,172	10	1,154,751	0	243	45	12,778	103	3,832
8-Sep	0	80,172	6	1,154,757	0	243	10	12,788	27	3,859
9-Sep	-2	80,170	2	1,154,759	0	243	12	12,800	18	3,877
10-Sep	4	80,174	4	1,154,763	0	243	6	12,806	26	3,903
11-Sep	2	80,176	2	1,154,765	0	243	-6	12,800	16	3,919
12-Sep	2	80,178	0	1,154,765	0	243	18	12,818	16	3,935

Appendix Table C.4. Snake River tower expanded daily and cumulative counts of chum, pink, chinook and coho salmon, 1996.

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
3-Jul	86	86	0	0	0	0	0	0
4-Jul	226	312	62	62	0	0	0	0
5-Jul	176	488	328	390	0	0	0	0
6-Jul	170	658	418	808	0	0	0	0
7-Jul	22	680	116	924	0	0	0	0
8-Jul	224	904	208	1,132	0	0	0	0
9-Jul	186	1,090	836	1,968	0	0	0	0
10-Jul	245	1,335	2,148	4,116	1	1	0	0
11-Jul	279	1,614	3,215	7,331	2	3	0	0
12-Jul	104	1,718	3,188	10,519	0	3	0	0
13-Jul	84	1,802	1,179	11,698	0	3	0	0
14-Jul	96	1,898	787	12,485	0	3	0	0
15-Jul	48	1,946	533	13,018	0	3	0	0
16-Jul	90	2,036	1,678	14,696	0	3	0	0
17-Jul	163	2,199	3,079	17,775	0	3	0	0
18-Jul	125	2,324	2,539	20,314	0	3	0	0
19-Jul	116	2,440	2,078	22,392	0	3	0	0
20-Jul	158	2,598	5,313	27,705	0	3	16	16
21-Jul	50	2,648	1,268	28,973	0	3	2	18
22-Jul	9	2,657	1,010	29,983	0	3	6	24
23-Jul	33	2,690	2,554	32,537	0	3	14	38
24-Jul	35	2,725	2,353	34,890	0	3	36	74
25-Jul	28	2,753	1,905	36,795	0	3	26	100
26-Jul	28	2,781	1,260	38,055	0	3	20	120
27-Jul	22	2,803	874	38,929	0	3	10	130
28-Jul	22	2,825	479	39,408	0	3	12	142
29-Jul	34	2,859	418	39,826	2	5	19	161
30-Jul	1	2,860	430	40,256	0	5	19	180
31-Jul	1	2,861	488	40,744	0	5	35	215
1-Aug	0	2,861	452	41,196	0	5	38	253
2-Aug	0	2,861	508	41,704	0	5	53	306
3-Aug	1	2,862	535	42,239	0	5	68	374
4-Aug	0	2,862	519	42,758	0	5	70	444
5-Aug	0	2,862	580	43,338	0	5	141	585
6-Aug	-5	2,857	140	43,478	0	5	71	656
7-Aug	-20	2,837	215	43,693	0	5	187	843
8-Aug	-20	2,817	247	43,940	0	5	148	991
9-Aug	-50	2,767	194	44,134	0	5	46	1,037
10-Aug	5	2,772	93	44,227	0	5	46	1,083
11-Aug	-1	2,771	24	44,251	0	5	24	1,107
12-Aug	0	2,771	34	44,285	0	5	67	1,174
13-Aug	0	2,771	71	44,356	0	5	62	1,236
14-Aug	0	2,771	71	44,427	0	5	52	1,288
15-Aug	0	2,771	34	44,461	0	5	64	1,352
16-Aug	0	2,771	27	44,488	0	5	90	1,442
17-Aug	0	2,771	7	44,495	0	5	66	1,508
18-Aug	0	2,771	15	44,510	0	5	40	1,548
19-Aug	1	2,772	11	44,521	0	5	24	1,572
20-Aug	0	2,772	15	44,536	0	5	20	1,592
21-Aug	0	2,772	12	44,548	0	5	30	1,622
22-Aug	0	2,772	10	44,558	0	5	16	1,638

Appendix Table C.5. Eldorado River tower expanded daily and cumulative counts of chum, pink, chinook and coho salmon, 1996.

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
30-Jun	751	751	622	622	6	6	0	0
1-Jul	-197	554	161	783	0	6	0	0
2-Jul	737	1,291	518	1,301	-2	4	0	0
3-Jul	3,462	4,753	2,708	4,009	6	10	0	0
4-Jul	1,012	5,765	1,288	5,297	0	10	0	0
5-Jul	1,550	7,315	3,238	8,535	4	14	0	0
6-Jul	1,363	8,678	5,888	14,423	4	18	0	0
7-Jul	1,175	9,853	8,537	22,960	4	22	0	0
8-Jul	587	10,440	4,733	27,693	0	22	0	0
9-Jul	495	10,935	5,852	33,545	6	28	0	0
10-Jul	432	11,367	3,964	37,509	0	28	0	0
11-Jul	275	11,642	1,203	38,712	-1	27	0	0
12-Jul	251	11,893	922	39,634	0	27	0	0
13-Jul	164	12,057	693	40,327	0	27	0	0
14-Jul	84	12,141	255	40,582	0	27	0	0
15-Jul	75	12,216	480	41,062	0	27	0	0
16-Jul	0	12,216	178	41,240	0	27	0	0
17-Jul	28	12,244	787	42,027	0	27	0	0
18-Jul	76	12,320	1,324	43,351	0	27	0	0
19-Jul	139	12,459	1,140	44,491	0	27	0	0
20-Jul	59	12,518	643	45,134	0	27	0	0
21-Jul	21	12,539	335	45,469	0	27	0	0
22-Jul	40	12,579	488	45,957	0	27	0	0
23-Jul	18	12,597	42	45,999	0	27	0	0
24-Jul	-2	12,595	21	46,020	0	27	16	16
25-Jul	6	12,601	-5	46,015	0	27	41	57
26-Jul	8	12,609	-4	46,011	0	27	30	87
27-Jul	8	12,617	3	46,014	0	27	32	119
28-Jul	5	12,622	1	46,015	0	27	21	140
29-Jul	8	12,630	5	46,020	0	27	13	153
30-Jul	7	12,637	11	46,031	0	27	13	166
31-Jul	6	12,643	18	46,049	0	27	4	170
1-Aug	4	12,647	10	46,059	0	27	6	176
2-Aug	1	12,648	15	46,074	0	27	6	182
3-Aug	-1	12,647	4	46,078	0	27	-3	179
4-Aug	0	12,647	15	46,093	0	27	14	193
5-Aug	0	12,647	10	46,103	0	27	8	201
6-Aug	0	12,647	14	46,117	0	27	8	209
7-Aug	0	12,647	4	46,121	0	27	6	215
8-Aug	0	12,647	8	46,129	0	27	10	225
9-Aug	0	12,647	3	46,132	0	27	2	227
10-Aug	0	12,647	0	46,132	0	27	3	230
11-Aug	0	12,647	0	46,132	0	27	2	232
12-Aug	0	12,647	2	46,134	0	27	1	233
13-Aug	0	12,647	1	46,135	0	27	0	233
14-Aug	0	12,647	0	46,135	0	27	-1	232
15-Aug	0	12,647	0	46,135	0	27	0	232
16-Aug	8	12,655	-6	46,129	0	27	0	232
17-Aug	4	12,659	-24	46,105	0	27	24	256
18-Aug	-2	12,657	-2	46,103	0	27	-6	250
19-Aug	-2	12,655	-8	46,095	0	27	46	296
20-Aug	0	12,655	0	46,095	0	27	28	324

Appendix Table C.6. North River tower expanded daily and cumulative counts of chum, pink, chinook and coho salmon, 1996.

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
16-Jun	0	0	0	0	8	8	0	0
17-Jun	16	16	2	2	-2	6	0	0
18-Jun	-12	4	2	4	-2	4	0	0
19-Jun	-22	-18	0	4	-4	0	0	0
20-Jun	8	-10	0	4	0	0	0	0
21-Jun	4	-6	3	7	-6	-6	0	0
22-Jun	0	-6	6	13	-3	-9	0	0
23-Jun	0	-6	56	69	0	-9	0	0
24-Jun	174	168	114	183	4	-5	0	0
25-Jun	12	180	94	277	-4	-9	0	0
26-Jun	21	201	189	466	-3	-12	0	0
27-Jun	25	226	206	672	-1	-13	0	0
28-Jun	27	253	286	958	-1	-14	0	0
29-Jun	36	289	381	1,339	0	-14	0	0
30-Jun	46	335	344	1,683	2	-12	0	0
1-Jul	162	497	754	2,437	10	-2	0	0
2-Jul	240	737	866	3,303	8	6	0	0
3-Jul	848	1,585	3,606	6,909	38	44	0	0
4-Jul	883	2,468	21,429	28,338	101	145	0	0
5-Jul	892	3,360	35,867	64,205	161	306	0	0
6-Jul	556	3,916	60,570	124,775	110	416	0	0
7-Jul	530	4,446	34,752	159,527	112	528	0	0
8-Jul	468	4,914	24,962	184,489	78	606	0	0
9-Jul	124	5,038	13,764	198,253	46	652	6	6
10-Jul	230	5,268	15,098	213,351	56	708	2	8
11-Jul	342	5,610	14,080	227,431	30	738	0	8
12-Jul	366	5,976	13,545	240,976	55	793	4	12
13-Jul	492	6,468	19,198	260,174	76	869	17	29
14-Jul	266	6,734	9,574	269,748	58	927	12	41
15-Jul	388	7,122	10,214	279,962	78	1,005	12	53
16-Jul	218	7,340	8,044	288,006	28	1,033	20	73
17-Jul	110	7,450	5,076	293,082	26	1,059	30	103
18-Jul	370	7,820	6,300	299,382	18	1,077	46	149
19-Jul	530	8,350	7,604	306,986	36	1,113	130	279
20-Jul	321	8,671	7,117	314,103	40	1,153	162	441
21-Jul	212	8,883	5,798	319,901	26	1,179	152	593
22-Jul	290	9,173	5,044	324,945	8	1,187	88	681
23-Jul	328	9,501	4,348	329,293	6	1,193	316	997
24-Jul	214	9,715	2,612	331,905	4	1,197	178	1,175
25-Jul	74	9,789	634	332,539	0	1,197	54	1,229

Appendix Table C.7. Shaktoolik River tower expanded daily and cumulative counts of chinook, pink, chum and coho salmon and Dolly Varden, 1996

Date	Chum Salmon		Pink Salmon		Chinook Salmon		Coho Salmon		Dolly Varden	
	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
17-Jun	9	9	-3	-3	3	3	0	0	-3	-3
18-Jun	16	25	51	48	0	3	0	0	18	15
19-Jun	24	49	61	109	19	22	0	0	6	21
20-Jun	118	167	3	112	297	319	0	0	3	24
21-Jun	219	386	91	203	103	422	0	0	6	30
22-Jun	69	455	24	227	3	425	0	0	-6	24
23-Jun	253	708	189	416	14	439	0	0	-9	15
24-Jun	491	1,199	350	766	117	556	0	0	-9	6
25-Jun	654	1,853	469	1,235	29	585	0	0	6	12
26-Jun	207	2,060	105	1,340	3	588	0	0	0	12
27-Jun	355	2,415	246	1,586	12	600	0	0	0	12
28-Jun	445	2,860	272	1,858	13	613	0	0	0	12
29-Jun	516	3,376	516	2,374	26	639	0	0	-3	9
30-Jun	429	3,805	450	2,824	166	805	0	0	-2	7
1-Jul	333	4,138	378	3,202	300	1,105	0	0	9	16
2-Jul	516	4,654	989	4,191	100	1,205	0	0	3	19
3-Jul	2,997	7,651	3,119	7,310	113	1,318	0	0	6	25
4-Jul	2,466	10,117	5,390	12,700	95	1,413	0	0	2	27
5-Jul	1,433	11,550	7,016	19,716	78	1,491	0	0	-3	24
6-Jul	1,557	13,107	22,115	41,831	118	1,609	0	0	0	24
7-Jul	7,234	20,341	51,996	93,827	85	1,694	0	0	4	28
8-Jul	12,903	33,244	81,870	175,697	48	1,742	0	0	6	34
9-Jul	686	33,930	45,020	220,717	52	1,794	0	0	0	34
10-Jul	1,614	35,544	143,896	364,613	59	1,853	0	0	0	34
11-Jul	819	36,363	72,211	436,824	28	1,881	0	0	-6	28
12-Jul	26	36,389	908	437,732	-2	1,879	0	0	-16	12
13-Jul	90	36,479	1,348	439,080	-1	1,878	0	0	-18	-6
14-Jul	724	37,203	7,747	446,827	1	1,879	0	0	-22	-28
15-Jul	1,347	38,550	14,136	460,963	3	1,882	0	0	-24	-52
16-Jul	832	39,382	10,594	471,557	2	1,884	21	21	-6	-58
17-Jul	367	39,749	7,871	479,428	1	1,885	50	71	0	-58
18-Jul	573	40,322	14,730	494,158	1	1,886	114	185	0	-58
19-Jul	781	41,103	22,867	517,025	0	1,886	186	371	0	-58
20-Jul	809	41,912	31,152	548,177	0	1,886	136	507	0	-58
21-Jul	850	42,762	28,429	576,606	0	1,886	194	701	1	-57
22-Jul	885	43,647	25,698	602,304	0	1,886	246	947	3	-54
23-Jul	1,089	44,736	19,662	621,966	0	1,886	472	1,419	0	-54
24-Jul	104	44,840	3,189	625,155	0	1,886	166	1,585	0	-54



Appendix Table D.1 Kotzebue District chum salmon commercial and commercial test fishing catch age and sex composition by period, and season summary, 1996

		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates:	7/08						
Sampling Dates:	7/08	Period 1					
Sample Size:	119						
Female	Percent of Sample	0.8	8.4	31.9	5.9	0.0	47.1
	Number in Catch	7	71	269	49	0	396
Male	Percent of Sample	0.0	12.6	28.6	11.8	0.0	52.9
	Number in Catch	0	106	240	99	0	445
Total	Percent of Sample	0.8	21.0	60.5	17.6	0.0	100.0
	Number in Catch	7	177	509	148	0	841
	Standard Error	7	32	38	30	0	
Stratum Dates:	7/09						
Sampling Dates:	7/09	Period 2					
Sample Size:	112						
Female	Percent of Sample	0.0	2.7	38.4	8.0	0.9	50.0
	Number in Catch	0	59	842	176	20	1,096
Male	Percent of Sample	0.0	10.7	37.5	1.8	0.0	50.0
	Number in Catch	0	235	822	39	0	1,096
Total	Percent of Sample	0.0	13.4	75.9	9.8	0.9	100.0
	Number in Catch	0	294	1,664	215	20	2,192
	Standard Error	0	71	89	62	20	
Stratum Dates:	7/10						
Sampling Dates:	7/10	Period 3					
Sample Size:	109						
Female	Percent of Sample	0.0	9.2	31.2	6.4	0.9	47.7
	Number in Catch	0	260	883	182	26	1,351
Male	Percent of Sample	0.0	11.0	33.0	6.4	1.8	52.3
	Number in Catch	0	312	935	182	52	1,480
Total	Percent of Sample	0.0	20.2	64.2	12.8	2.8	100.0
	Number in Catch	0	571	1,818	364	78	2,831
	Standard Error	0	109	131	91	45	
Stratum Dates:	7/11						
Sampling Dates:	7/11	Period 4					
Sample Size:	117						
Female	Percent of Sample	0.0	12.0	23.9	9.4	0.0	45.3
	Number in Catch	0	583	1,166	458	0	2,207
Male	Percent of Sample	0.0	15.4	30.8	8.5	0.0	54.7
	Number in Catch	0	750	1,499	416	0	2,665
Total	Percent of Sample	0.0	27.4	54.7	17.9	0.0	100.0
	Number in Catch	0	1,333	2,665	874	0	4,872
	Standard Error	0	202	225	174	0	

(continued)

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		Brood Year and (Age Group)					Total
		1993	1992	1991	1990	1989	
		(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	
Stratum Dates:		7/17	Period 5				
Sampling Dates:		7/17					
Sample Size:		267					
Female	Percent of Sample	0.0	7.5	28.6	3.0	0.0	39.1
	Number in Catch	0	270	1,026	108	0	1,404
Male	Percent of Sample	0.0	16.5	38.7	5.3	0.4	60.9
	Number in Catch	0	594	1,390	189	13	2,186
Total	Percent of Sample	0.0	24.1	67.3	8.3	0.4	100.0
	Number in Catch	0	864	2,416	297	13	3,590
	Standard Error	0	94	103	61	13	
Stratum Dates:		7/18	Period 6				
Sampling Dates:		7/18					
Sample Size:		152					
Female	Percent of Sample	0.0	13.8	29.6	3.9	0.0	47.4
	Number in Catch	0	791	1,694	226	0	2,710
Male	Percent of Sample	0.0	13.2	32.2	7.2	0.0	52.6
	Number in Catch	0	753	1,845	414	0	3,012
Total	Percent of Sample	0.0	27.0	61.8	11.2	0.0	100.0
	Number in Catch	0	1,543	3,539	640	0	5,722
	Standard Error	0	207	226	147	0	
Stratum Dates:		7/23	Period 7				
Sampling Dates:		7/23					
Sample Size:		152					
Female	Percent of Sample	0.0	8.6	33.6	4.6	0.0	46.7
	Number in Catch	0	305	1,195	164	0	1,663
Male	Percent of Sample	0.0	13.2	34.9	4.6	0.7	53.3
	Number in Catch	0	469	1,242	164	23	1,898
Total	Percent of Sample	0.0	21.7	68.4	9.2	0.7	100.0
	Number in Catch	0	773	2,436	328	23	3,561
	Standard Error	0	119	135	84	23	
Stratum Dates:		7/24	Period 8				
Sampling Dates:		7/24					
Sample Size:		110					
Female	Percent of Sample	0.0	18.2	20.0	5.5	0.0	43.6
	Number in Catch	0	883	972	265	0	2,120
Male	Percent of Sample	0.0	17.3	29.1	10.0	0.0	56.4
	Number in Catch	0	839	1,414	486	0	2,739
Total	Percent of Sample	0.0	35.5	49.1	15.5	0.0	100.0
	Number in Catch	0	1,723	2,385	751	0	4,859
	Standard Error	0	223	233	168	0	

(continued)

Appendix Table D.1 (page 3 of 6)

		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates: 7/25							
Sampling Dates: 7/25		Period 9					
Sample Size: 158							
Female	Percent of Sample	0.6	20.9	25.9	5.1	0.0	52.5
	Number in Catch	15	492	612	119	0	1,238
Male	Percent of Sample	1.3	22.2	22.2	1.9	0.0	47.5
	Number in Catch	30	522	522	45	0	1,119
Total	Percent of Sample	1.9	43.0	48.1	7.0	0.0	100.0
	Number in Catch	45	1,014	1,134	164	0	2,357
	Standard Error	26	93	94	48	0	
Stratum Dates: 7/26							
Sampling Dates: 7/26		Period 10					
Sample Size: 119							
Female	Percent of Sample	0.0	17.6	23.5	0.8	0.0	42.0
	Number in Catch	0	1,382	1,842	66	0	3,290
Male	Percent of Sample	0.8	23.5	28.6	4.2	0.8	58.0
	Number in Catch	66	1,842	2,237	329	66	4,540
Total	Percent of Sample	0.8	41.2	52.1	5.0	0.8	100.0
	Number in Catch	66	3,224	4,079	395	66	7,830
	Standard Error	66	355	360	158	66	
Stratum Dates: 7/29							
Sampling Dates: 7/29		Period 11					
Sample Size: 118							
Female	Percent of Sample	0.9	14.5	20.5	5.5	0.0	44.4
	Number in Catch	41	699	987	411	0	2,138
Male	Percent of Sample	0.0	19.7	28.2	7.7	0.0	55.6
	Number in Catch	0	946	1,357	370	0	2,673
Total	Percent of Sample	0.9	34.2	48.7	16.2	0.0	100.0
	Number in Catch	41	1,645	2,344	781	0	4,811
	Standard Error	41	211	222	164	0	
Stratum Dates: 8/02							
Sampling Dates: 8/02		Test Period 1					
Sample Size: 157							
Female	Percent of Sample	0.0	21.7	27.4	2.5	0.0	51.6
	Number in Catch	0	34	43	4	0	81
Male	Percent of Sample	0.6	24.2	18.5	5.1	0.0	48.4
	Number in Catch	1	38	29	8	0	76
Total	Percent of Sample	0.6	45.9	45.9	7.6	0.0	100.0
	Number in Catch	1	72	72	12	0	157
	Standard Error	1	6	6	3	0	

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		Brood Year and (Age Group)					
		1993	1992	1991	1990	1989	Total
		(0.2)	(0.3)	(0.4)	(0.5)	(0.6)	
Sampling Dates: 8/05		Period 12					
Sample Size: 117							
Female	Percent of Sample	0.9	29.1	25.6	2.6	0.0	58.1
	Number in Catch	88	3,000	2,647	265	0	5,999
Male	Percent of Sample	0.0	23.1	14.5	3.4	0.9	41.9
	Number in Catch	0	2,382	1,500	353	88	4,323
Total	Percent of Sample	0.9	52.1	40.2	6.0	0.9	100.0
	Number in Catch	88	5,382	4,146	618	88	10,322
	Standard Error	88	479	470	227	88	
Stratum Dates: 8/06		Period 13					
Sampling Dates: 8/06							
Sample Size: 149							
Female	Percent of Sample	0.0	23.5	28.2	2.0	0.0	53.7
	Number in Catch	0	2,297	2,756	197	0	5,250
Male	Percent of Sample	0.7	21.5	18.8	4.7	0.7	46.3
	Number in Catch	66	2,100	1,838	459	66	4,529
Total	Percent of Sample	0.7	45.0	47.0	6.7	0.7	100.0
	Number in Catch	66	4,397	4,594	656	66	9,779
	Standard Error	66	400	401	201	66	
Stratum Dates: 8/09		Test Period 2					
Sampling Dates: 8/09							
Sample Size: 185							
Female	Percent of Sample	0.5	25.4	22.7	1.1	0.0	49.7
	Number in Catch	1	47	42	2	0	92
Male	Percent of Sample	0.0	27.6	19.5	3.2	0.0	50.3
	Number in Catch	0	51	36	6	0	93
Total	Percent of Sample	0.5	53.0	42.2	4.3	0.0	100.0
	Number in Catch	1	98	78	8	0	185
	Standard Error	1	7	7	3	0	
Stratum Dates: 8/14		Period 14 *					
Sampling Dates: 8/14							
Sample Size: 153							
Female	Percent of Sample	0.0	22.2	17.6	4.6	0.0	44.4
	Number in Catch	0	34	27	7	0	68
Male	Percent of Sample	1.3	25.5	27.5	1.3	0.0	55.6
	Number in Catch	2	39	42	2	0	85
Total	Percent of Sample	1.3	47.7	45.1	5.9	0.0	100.0
	Number in Catch	2	73	69	9	0	153
	Standard Error	1	6	6	3	0	

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Appendix Table D.1. (page 5 of 6)

		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates:	8/16						
Sampling Dates:	8/16	Period 15					
Sample Size:	149						
Female	Percent of Sample	0.7	37.6	22.8	0.7	0.0	61.7
	Number in Catch	31	1,759	1,068	31	0	2,889
Male	Percent of Sample	3.4	21.5	12.8	0.7	0.0	38.3
	Number in Catch	157	1,005	597	31	0	1,790
Total	Percent of Sample	4.0	59.1	35.6	1.3	0.0	100.0
	Number in Catch	188	2,763	1,664	63	0	4,679
	Standard Error	76	189	184	44	0	
Stratum Dates:	8/19						
Sampling Dates:	8/19	Period 16					
Sample Size:	147						
Female	Percent of Sample	0.0	29.3	24.5	2.0	0.0	55.8
	Number in Catch	0	375	314	26	0	716
Male	Percent of Sample	0.7	17.0	22.4	4.1	0.0	44.2
	Number in Catch	9	218	288	52	0	567
Total	Percent of Sample	0.7	46.3	46.9	6.1	0.0	100.0
	Number in Catch	9	593	602	79	0	1,283
	Standard Error	9	53	53	25	0	
Stratum Dates:	8/20						
Sampling Dates:	8/20	Period 17					
Sample Size:	108						
Female	Percent of Sample	3.7	30.6	11.1	3.7	0.0	49.1
	Number in Catch	100	825	300	100	0	1,325
Male	Percent of Sample	0.9	33.3	9.3	7.4	0.0	50.9
	Number in Catch	25	900	250	200	0	1,375
Total	Percent of Sample	4.6	63.9	20.4	11.1	0.0	100.0
	Number in Catch	125	1,725	550	300	0	2,700
	Standard Error	55	125	105	82	0	
Stratum Dates:	8/21						
Sampling Dates:	8/21	Period 18					
Sample Size:	110						
Female	Percent of Sample	0.0	22.7	23.6	3.6	0.0	50.0
	Number in Catch	0	90	93	14	0	197
Male	Percent of Sample	0.0	29.1	18.2	2.7	0.0	50.0
	Number in Catch	0	115	72	11	0	197
Total	Percent of Sample	0.0	51.8	41.8	6.4	0.0	100.0
	Number in Catch	0	204	165	25	0	394
	Standard Error	0	19	19	9	0	

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Appendix Table D.1. (page 6 of 6)

		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates: 8/23							
Sampling Dates: 8/23		Period 19					
Sample Size: 73							
Female	Percent of Sample	0.0	32.9	21.9	4.1	0.0	58.9
	Number in Catch	0	2,396	1,597	299	0	4,292
Male	Percent of Sample	1.4	26.0	11.0	2.7	0.0	41.1
	Number in Catch	100	1,897	799	200	0	2,995
Total	Percent of Sample	1.4	58.9	32.9	6.8	0.0	100.0
	Number in Catch	100	4,292	2,396	499	0	7,287
	Standard Error	100	423	403	217	0	
Stratum Dates: 8/26							
Sampling Dates: 8/26		Test Period 4					
Sample Size: 134							
Female	Percent of Sample	0.0	34.3	23.1	1.5	0.0	59.0
	Number in Catch	0	46	31	2	0	79
Male	Percent of Sample	1.5	20.1	17.2	2.2	0.0	41.0
	Number in Catch	2	27	23	3	0	55
Total	Percent of Sample	1.5	54.5	40.3	3.7	0.0	100.0
	Number in Catch	2	73	54	5	0	134
	Standard Error	1	6	6	2	0	
Stratum Dates: 7/08							
Sampling Dates: 8/26		Test Periods combined					
Sample Size: 629							
Female	Percent of Sample	0.2	25.6	22.7	2.4	0.0	50.9
	Number in Catch	1	161	143	15	0	320
Male	Percent of Sample	0.8	24.6	20.7	3.0	0.0	49.1
	Number in Catch	5	155	130	19	0	309
Total	Percent of Sample	1.0	50.2	43.4	5.4	0.0	100.0
	Number in Catch	6	316	273	34	0	629
	Standard Error	2	13	12	6	0	
Stratum Dates: 7/08							
Sampling Dates: 8/26		Commercial Periods Combined					
Sample Size: 2,386							
Female	Percent of Sample	0.4	20.7	25.4	4.0	0.1	50.4
	Number in Catch	283	16,534	20,262	3,158	46	40,282
Male	Percent of Sample	0.6	20.0	23.6	5.1	0.4	49.6
	Number in Catch	452	15,983	18,845	4,040	309	39,628
Total	Percent of Sample	0.9	40.7	48.9	9.0	0.4	100.0
	Number in Catch	735	32,518	39,106	7,197	354	79,910
	Standard Error	156	804	818	468	109	

\* Buyer did not purchase fish. Age composition is based on commercial test fish samples.

Appendix Table D.2. Kobuk River drift gillnet test fishing chum salmon catch age and sex composition, by time period and season total, 1996.

		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates: 7/9-7/14							
Sampling Dates: 7/9-7/14							
Female	Sample Size	0	3	60	13	0	76
	Percent of Sample	0.0	1.5	30.0	6.5	0.0	38.0
Male	Sample Size	0	17	86	19	2	124
	Percent of Sample	0.0	8.5	43.0	9.5	1.0	62.0
Total	Sample Size	0	20	146	32	2	200
	Percent of Sample	0.0	10.0	73.0	16.0	1.0	100.0
	Standard Error	0	2	3	3	1	
Stratum Dates: 7/15-7/21							
Sampling Dates: 7/15-7/21							
Sample Size: 314							
Female	Sample Size	0	21	85	16	0	122
	Percent of Sample	0.0	6.5	27.1	5.2	0.0	38.9
Male	Sample Size	0	32	134	26	0	192
	Percent of Sample	0.0	10.3	42.6	8.2	0.0	61.1
Total	Sample Size	0	53	219	42	0	314
	Percent of Sample	0.0	16.8	69.7	13.4	0.0	100.0
	Standard Error	0	2	3	2	0	
Stratum Dates: 7/22-7/28							
Sampling Dates: 7/22-7/28							
Female	Sample Size	0	27	77	9	0	113
	Percent of Sample	0.0	9.5	27.2	3.2	0.0	39.9
Male	Sample Size	2	51	102	13	2	171
	Percent of Sample	0.7	18.0	36.0	4.6	0.7	60.1
Total	Sample Size	2	78	180	22	2	284
	Percent of Sample	0.7	27.6	63.3	7.8	0.7	100.0
	Standard Error	0	3	3	2	0	
Stratum Dates: 7/29-8/04							
Sampling Dates: 7/29-8/04							
Female	Sample Size	0	56	85	11	0	152
	Percent of Sample	0.0	18.1	27.5	3.6	0.0	49.2
Male	Sample Size	1	66	76	14	0	158
	Percent of Sample	0.3	21.4	24.6	4.5	0.0	50.8
Total	Sample Size	1	122	162	25	0	310
	Percent of Sample	0.3	39.5	52.1	8.1	0.0	100.0
	Standard Error	0	3	3	2	0	

(continued)

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		Brood Year and (Age Group)					Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	1989 (0.6)	
Stratum Dates: 8/05-8/11							
Sampling Dates: 8/05-8/11							
Female	Sample Size	2	73	110	7	0	192
	Percent of Sample	0.6	21.3	32.1	2.0	0.0	56.0
Male	Sample Size	1	73	66	11	0	151
	Percent of Sample	0.3	21.3	19.2	3.2	0.0	44.0
Total	Sample Size	3	146	176	18	0	343
	Percent of Sample	0.9	42.6	51.3	5.2	0.0	100.0
	Standard Error	1	3	3	1	0	
Stratum Dates: 8/12-8/18							
Sampling Dates: 8/12-8/18							
Female	Sample Size	1	39	40	1	1	82
	Percent of Sample	0.5	21.4	22.0	0.5	0.5	45.1
Male	Sample Size	1	63	31	5	0	100
	Percent of Sample	0.5	34.6	17.0	2.7	0.0	54.9
Total	Sample Size	2	102	71	6	1	182
	Percent of Sample	1.1	56.0	39.0	3.3	0.5	100.0
	Standard Error	1	4	4	1	1	
Stratum Dates: 7/09-8/18							
Sampling Dates: 7/09-8/18		Season Total					
Female	Sample Size	3	219	458	57	1	738
	Percent of Sample	0.2	13.4	28.0	3.5	0.1	45.2
Male	Sample Size	5	303	495	88	4	895
	Percent of Sample	0.3	18.5	30.3	5.4	0.2	54.8
Total	Sample Size	8	521	953	145	5	1,633
	Percent of Sample	0.5	31.9	58.4	8.9	0.3	100.0
	Standard Error	0	1	1	1	0	



Appendix Table D.3. Noatak River drift gillnet test fishing chum salmon catch age and sex composition by date, 1996.

		Brood Year and (Age Group)				Total
		1993 (0.2)	1992 (0.3)	1991 (0.4)	1990 (0.5)	
Stratum Dates: 7/28						
Sampling Dates: 7/28						
Female	Sample Size	0	5	17	1	23
	Percent of Sample	0.0	10.4	35.4	2.1	47.9
Male	Sample Size	0	9	14	2	25
	Percent of Sample	0.0	18.8	29.2	4.2	52.1
Total	Sample Size	0	14	31	3	48
	Percent of Sample	0.0	29.2	64.6	6.3	100.0
	Standard Error		6.6	7.0	3.5	
Stratum Dates: 08/07						
Sampling Dates: 08/07						
Female	Sample Size	0	15	27	6	48
	Percent of Sample	0.0	16.5	29.7	6.6	52.7
Male	Sample Size	0	21	20	2	43
	Percent of Sample	0.0	23.1	22.0	2.2	47.3
Total	Sample Size	0	36	47	8	91
	Percent of Sample	0.0	39.6	51.6	8.8	100.0
	Standard Error		5.2	5.3	3.0	
Stratum Dates: 8/13						
Sampling Dates: 8/13						
Female	Sample Size	1	20	12	3	35
	Percent of Sample	1.3	26.3	15.8	3.9	46.1
Male	Sample Size	0	19	18	4	41
	Percent of Sample	0.0	25.0	23.7	5.3	53.9
Total	Sample Size	1	39	30	7	76
	Percent of Sample	1.3	51.3	39.5	9.2	100.0
	Standard Error	1.3	5.8	5.6	3.3	
Stratum Dates: 8/22						
Sampling Dates: 8/22						
Female	Sample Size	1	21	16	1	38
	Percent of Sample	1.6	32.8	25.0	1.6	59.4
Male	Sample Size	0	18	8	0	26
	Percent of Sample	0.0	28.1	12.5	0.0	40.6
Total	Sample Size	1	39	24	1	64
	Percent of Sample	1.6	60.9	37.5	1.6	100.0
	Standard Error	1.6	6.1	6.1	1.6	

(continued)

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		Brood Year and (Age Group)				
		1993	1992	1991	1990	Total
		(0.2)	(0.3)	(0.4)	(0.5)	
Stratum Dates:		8/27				
Sampling Dates:		8/27				
Female	Sample Size	0	24	18	2	44
	Percent of Sample	0.0	36.4	27.3	3.0	66.7
Male	Sample Size	0	11	8	3	22
	Percent of Sample	0.0	16.7	12.1	4.5	33.3
Total	Sample Size	0	35	26	5	66
	Percent of Sample	0.0	53.0	39.4	7.6	100.0
	Standard Error		6.2	6.1	3.3	
Stratum Dates:		7/28-8/27				
Sampling Dates:		7/28-8/27				
		Season Total				
Female	Sample Size	2	85	90	13	188
	Percent of Sample	0.6	24.6	26.1	3.8	54.5
Male	Sample Size	0	78	68	11	157
	Percent of Sample	0.0	22.6	19.7	3.2	45.5
Total	Sample Size	2	163	158	24	345
	Percent of Sample	0.6	47.2	45.8	7.0	100.0
	Standard Error	0.4	2.7	2.7	1.4	

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